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ORIGINAL COMMUNICATIONS.

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NOTES ON PATHOLOGY OF THE EAR.

BY PROF. DR. GUSTAV BRUEHL, BERLIN.

1. GUMMATOUS INVASION OF THE MASTOID PROCESS.—In 1906, I presented a patient before the otological society of Berlin with the following history: Patient, 33 years old, had a syphilitic infection in 1889. Thirteen years after this infection he received specific treatment as a result of severe headaches. In October, 1904, the patient again underwent mercurial treatment because of a recurrence of the headaches, and was referred to me as he also complained of tinnitus and deafness in the right ear. Upon examination I found a normal tympanic membrane but a hearing-test of the right ear revealed an advanced deafness due to affection of the nerve-apparatus. In the course of the following fourteen days a sensitively fluctuating tumor, the size of a hen's egg, developed in the mastoid process, as well as a facial paralysis involving all the branches except those of the velum palati. When the patient stooped, blindfolded, he reeled; upon walking he swayed toward the right. The mastoid tumor disappeared after a fourteen-days' specific treatment; the facial paralysis was also relieved, but the right ear became entirely deaf. This is the only case of gummatous invasion of the mastoid process which I have encountered; but a case of temporal bone-affection with pathological changes which I observed some time ago, reminded me of the above-reported case.

In this instance it was a case* of a right temporal bone in which the surface of the mastoid process was a concavity, hollowed

*Figure 1.

out to such an extent that the upper half appeared as a cleft-like cavity about one centimeter in depth and four millimeters in breath and with a scalloped wedge-shaped margin. On the anterior superior portion there is a fine fissure running from the cavity to the superior bony auditory canal-wall. Here an irregular bony projection of eight millimeters proceeds downward into the lumen of the bony auditory canal. There are several furrows in the otherwise perfectly smooth cortical surface of mastoid radiating toward the cavity. From the inner plane of the mastoid process one can ascertain that the fissure runs through to the external wall of the sigmoid

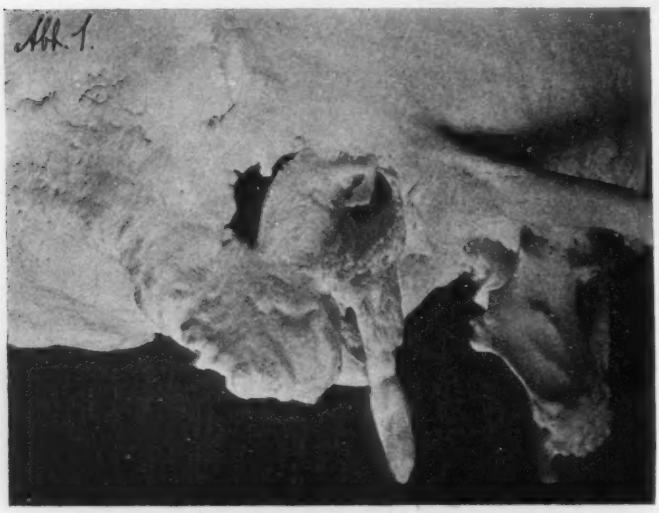

Figure 1.

sulcus so that at this point the sinus is covered by the soft portion of the mastoid. The loss in substance is greater on the interior of the mastoid than on the exterior. The posterior portion of the pyramid shows a bony defect with considerably undermined yet smooth edges. Into this one can pass a probe for almost one centimeter up in an anterior direction. This opening in the bone does not penetrate into the antrum. On the external surface of the squama, especially on that part lying above the zygomatic process one can see numerous depressions and in the neighborhood of its junction with the sphenoid rough, sharp hyperostoses. Otherwise the aural portion of the temporal bone shows no anomalies.

The specimen points to the conclusion that this was a case of cured gummatous invasion of the mastoid process. It seems of especial note that the osseous destruction is more pronounced on the inner side of the mastoid in the center of the pyramid than in the external portion. Through this defect in the mastoid process the sigmoid sinus is exposed.

2. ENTIRE SEPARATION OF THE SQUAMA FROM THE PETROSA AND FROM THE TYMPANIC CAVITY IN THE TEMPORALE BONE OF AN ADULT.*—It is unusual to find fully developed petro-squamosal squamo-mastoid sutures in an adult. It is but very seldom that the

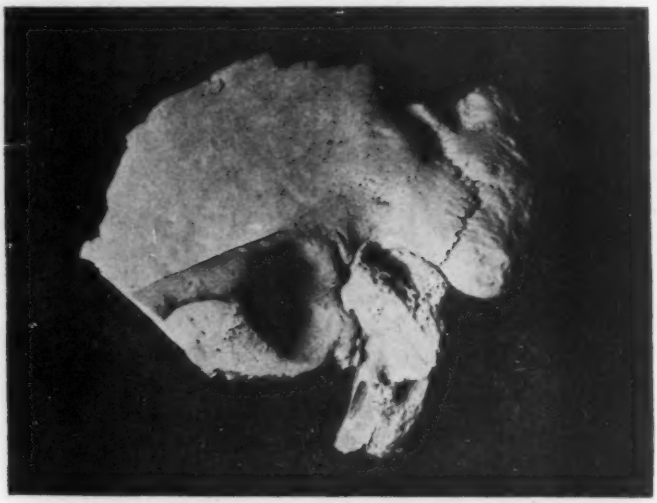

Figure 2.

process is so completely developed in the adult that it quite divides the temporal bone into two independent parts.

In the above-mentioned temporal bone we have the same conditions as those in the case reported by Frey, in the *Arch. fuer Ohrenheilkunde*, 1906, namely, a typical cleft in the mastoid process, such that there is merely a connective tissue between the mastoid, petrous bone and the osseous portion of the ear. If one takes the two bone-connected portions of the temporal bone apart, that portion of the mastoid process on the external surface of the squama becomes visible, as well as the perfectly smooth, polished-like inner half of the mastoid. In the inner portion no cells are visible under this smooth surface, but in the external part occasional dark cell-shad-

*Figures 2, 3 and 4.

ows are seen shining through. The data to be obtained from such exact examination of the temporal bone has been fully discussed by Frey in the article previously cited, so that a mere mention of this very unusual condition will suffice.

3. Bony Atresia of the Ear and Connective Tissue-Atresia of the Ear with Spontaneously Cured Labyrinthitis.—

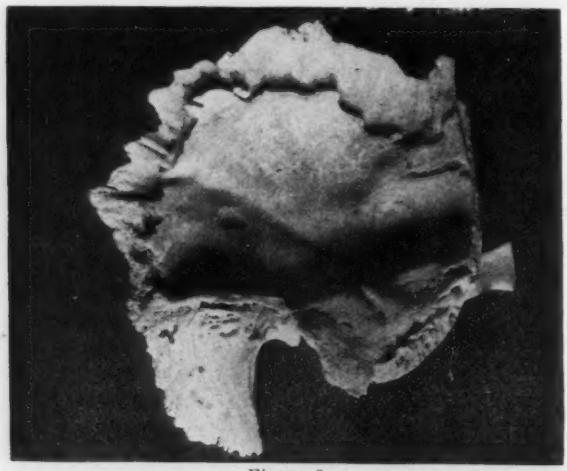

Figure 3.

Figure 4.

Atresias of the external ear which are not due to operative intervention are, clinically, somewhat rare. Since their antomical examination is not of frequent occurrence I shall take the liberty of reporting two such cases.

In the first case—of which I have merely the macroscopic finding, since the history was lost—the petrous portion of the ear* is found

*Figure 5.

directly at the porus acusticus externus; it is occluded by a broad, bony lamina arising with a wide base at the posterior bony auditory wall and running anteriorly along the wall and forming with it a protuberant union. Above and below the very thin lamella there is a very small opening of about 1½ millimeters. It is possible that this bony lamella is the result of a membranous granulation-mass, arising from and occluding the bony auditory canal, originating from a diffuse external otitis; for there are no deeper seated destructions posterior to the osseous lamella either in the auditory passage or in the middle-ear. It is apparent that in such a case operative re-

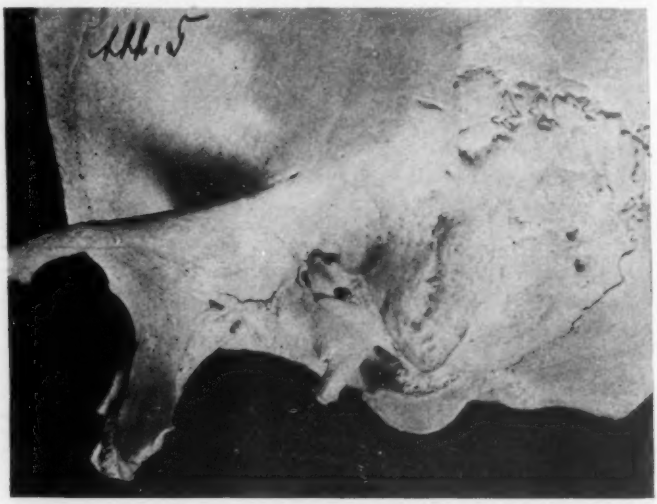

Figure 5.

moval of the bony atresia which was most likely covered, externally, by continuous epidermal layers would have resulted in marked improvement in hearing. This case is similar to one of bony atresia of the auditory meatus reported by Politzer in his "Lehrbuch," p. 223, 1908.

On the other hand the next case is one of atresia of the connective tissue of the auditory meatus. This temporal bone, which has also been histologically examined, was obtained from a woman of 80 years. Ante-mortem examination showed residual tissue on the right side and the left bony portion of the meatus was occluded by a greyish-white epidermal-covered membrane which joined itself to the meatal wall without well-defined outlines. On the right ear loud

speech was heard; the left was quite deaf. Death resulted from cardiac weakness. An histological examination* of the left ear revealed an occlusion of the bony meatus due to a thin atrophic epidermal stratum[1] on which there were signs of papillo, similar to glands or hair-follicles, as in a case of stricture described by me in the *Monatsschrift fuer Ohrenheilkunde,* Band 50. There is no remnant of the normal middle-ear. In back of the epidermal membrane there is a connective tissue with few nuclei and vessels, rich in fat-cells;[2] in the center only there is found a celloidin-filled cavity. At one point this fatty connective tissue enters deep into the petrous bone, perhaps at the vestibule,[3] though there is little that points to

Figure 6.

a normal structure or contents. Perhaps the narrow space through which the connective tissue passes from the middle-ear into the region of the vestibule also represents the vesibular window.[4] There is no trace of the semi-circular canals. The mastoid cells are filled with solid fibrous tissue.[5] In the semi-circular canal-region only an ivory-like bony mass[6] may be seen; while, on the other hand, the configuration of the cochlea is plainly visible and shows characteristic changes.[7] The one basal convolution of the cochlea† is completely filled with newly-formed bone[8] containing but few cell-empty spaces; on the opposite basal convolution,[9] however, the upper half

*Figure 6. †Figure 7.

contains solid, red bone, while in the lower half there is cell-free connective tissue into which delicate bony spans protrude. The spiral ganglion of both convolutions is easily recognizable and contains about twenty gangionic cells.[10] The newly-developed bone-formation is limited to the basal convolution; at the center and top we find partially coagulated masses and some solid fibrous tissue. The spiral ganglion is the only remains of the normal cochlear structure. The nerves entering the modiolus of the cochlea are thin and rich in sandy bodies.[11] The newly-formed bone is colored with eosin and shows a lamella-like structure and regularly appointed osseous bodies. It is interwoven with bluish Haversian canals and

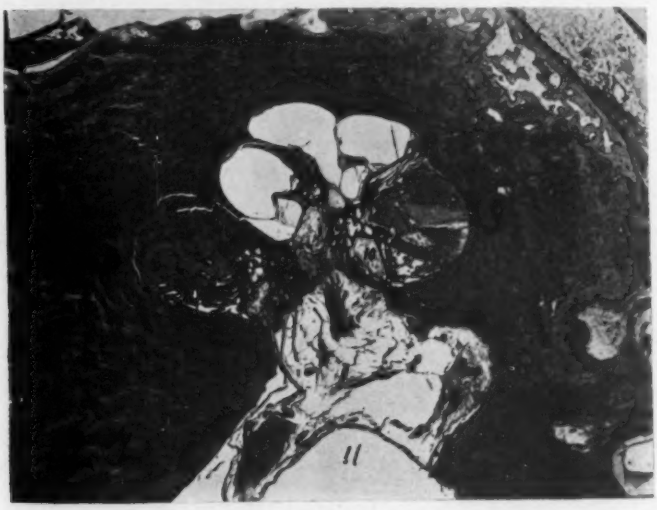

Figure 7.

is quite distinct from the surrounding labyrinthine bone of the interglobular space. One is, therefore, led to conclude that the new osseous formations originate in the endosteum of the labyrinth. This, then, is a case of severe aural suppurative which resulted in complete disturbance of the middle and inner-ear and in atresia of the auditory meatus. Apart from the interest centering about the histological findings in atresia of the bony auditory meatus, this case is of note because in this instance we have a spontaneous cure in a severe suppurative labyrinthitis which resulted in the entire destruction of the semi-circular canals and in extensive osseous cochlear obliteration.

VERTIGO OF VESTIBULAR PARALYSIS.*

BY PHILIP D. KERRISON, M. D., NEW YORK.

The purpose of this paper is to describe a clinical phase of suppurative labyrinthitis which, so far as the writer knows, has escaped formal identification and description in the literature of the subject, viz.,—the vertigo of the latent, or quiescent, stage of the disease.

Wherever labyrinthine vertigo is mentioned, we find reference to the so-called "vestibular vertigo," or "vertigo of vestibular irritation," so graphically described by Bárány. The essential features of this phenomenon,—i. e., its invariable presence at the onset and beginning of the acute stage, its rotary character, i. e., the patient's subjective sense of the rotation of surrounding objects in the same plane as that of the co-incident nystagmus,—these characteristic features are familiar to all of us. As further identifying it, Bárány has formulated the following law: Vertigo of vestibular origin is always accompanied by vestibular nystagmus, and is always increased when the eyes are turned in the direction of the quick nystagmic movement. I personally believe that this contention of Bárány is well founded, my reason for this belief being (1) that I have seen no instance of indisputable vestibular vertigo in which vestibular nystagmus was absent; and (2) in studying the phenomena of experimental irritation of the vestibule,—e. g., in the caloric and rotation experiments,—the vertigo, or at least its resulting ataxia, has invariably subsided a little before the nystagmus. But if we accept Bárány's law we must be prepared also to believe that when in suppurative labyrinthitis the spontaneous nystagmus has completely subsided, vestibular vertigo can no longer be present.

Apparent contradictions to this latter generalization have proved something of a stumbling-block to those who have been able to recognize only one type of labyrinthine vertigo. For example, a colleague of mine mentioned to me that a patient, one of whose labyrinths he had removed several weeks previously, continued to suffer from vertigo. I had an opportunity of examining this patient and found that her vertigo was distinctly not of vestibular type. There are many similar cases and they furnish the basis for the

*Read before the Meeting of the American Otological Society, Atlantic City, N. J., June 27, 1911.

writer's contention, viz., that in diffuse suppurative labyrinthitis there are two quite distinct forms of vertigo, viz., (1) the vertigo of vestibular irritation which characterizes the acute stage of the disease, and (2) the vertigo of vestibular paralysis which characterizes the latent or quiescent stage. It is the latter type which the writer wishes very briefly to discuss.

ORIENTATION: It is clear that the power of maintaining one's equilibrium in all customary positions of the body depends upon what is called orientation, or the subconscious knowledge of the position of the body in space. If through accident, or attempting the unusual, the body is thrown into positions in which its usual relations to the three planes of space are reversed, orientation becomes defective or insufficient, and the subjective disturbance known as vertigo results. Again, if the faculty of orientation is suddenly disturbed or ablated, the individual at once loses his sense of stability in space, or in other words experiences vertigo. Obviously a study of this form of vertigo is a study of defective orientation.

That the static function of the labyrinth is the most important element of orientation there can be no doubt. The vestibular organs cannot, however, be regarded as the essential organs of orientation, for after removal of one or both labyrinths, the individual regains in time his equilibrium. There must be, therefore, other contributory factors, and these are found in the muscular and arthrodial senses, the tactile sense and the sense of sight. Nor is it difficult to appreciate their importance to correct orientation, for while it is the vestibular function to inform one as to the position of one's body in space, it is obvious that only through the tactile, muscular and arthrodial senses can one appreciate the relation of the body to that on which it rests or is supported, and the position which the various parts of the body occupy in relation to each other.

The investigations of R. T. Slinger and Sir Victor Horsley, published in 1906, have so important a bearing upon orientation, and indirectly upon the vertigo and ataxia of vestibular paralysis, that we shall take time to discuss briefly their results. The purpose of these experiments was to measure the approximate accuracy or normal degrees of error in what they called topognosis, or "the orientation of points of space" by the muscular and arthrodial senses. These experiments were carried out in the following way: The person experimented upon is blindfolded, and before him is held a glass plate graduated in squares of a half centimetre. The

plate being placed in one of the three planes of space,—let us say the saggital-vertical—i. e., the vertical plane bisecting his body antero-posteriorly—the left hand is passively moved in different directions and the tip of its forefinger then brought in contact with some point upon the plate. He is then directed to bring the tip of the right forefinger to a corresponding point upon the opposite surface of the plate. It is obvious that in this test no information is gained through his tactile sense, which would convey the same impression wherever the finger might rest. Sight also is eliminated by the blind-folding of the person examined. Orientation must therefore be chiefly attributed to the muscular and arthrodial senses. This experiment was repeated with a large number of normal persons, the glass plate being held in different planes—i.e., the saggital-vertical, the frontal-vertical and the horizontal. It was found that there is a physiological or normal variation or error which varied greatly according to the position of the plate in relation to the body. Thus, with the plate held in front of him in a vertical plane corresponding to the mediai antero-posterior plane of the body, and at a height bringing the wrists to about the level of the lower end of the sternum, the physiological variation or error was found to be from one and one-fourth to one and one-half centimetres, usually in the direction of propinquity,—i. e., the right forefinger being placed nearer the body by one and one-fourth to one and one-half centimetres than the finger passively placed in contact with the plate. As the plate, still in the same vertical plane, is gradually elevated,—e. g., first to a level opposite the neck, then opposite the head and lastly above it,—the average error of orientation shows progressive and very rapid increase. When the experiment is repeated with the plate in the same plane but behind the person examined, the error is even greater. From these variations the investigators concluded that "there is a progressive diminution of knowledge of space as we pass outward from the central axis of the body."

These experiments were repeated with twenty-two adolescents or young adults who had become totally and permanently blind in early childhood, and with this interesting result,—viz., that the blind subjects exhibited similar errors which also varied in accordance with the level or height at which the plate was held; but the errors were distinctly smaller, the average error being less by one-fourth than the average error of people with normal eyes. From this they concluded that "if the information gained by sight is permanently blotted out, the muscular sense under necessity can by education be

brought to a point at least one-fourth better than that learned by the normal person."

The above experiments are particularly interesting and important in their bearing upon the compensatory power of one part of the complex mechanism of orientation to assume the work of another part whose function is annulled. We have seen that in the normal man orientation is a complex function in which the vestibular apparatus, the muscular, arthrodial and tactile senses and sight all take part. When sight is lost, muscular and arthrodial impressions become more sensitive and accurate. When one vestibular apparatus is destroyed, the opposite labyrinth must become accustomed to unopposed, unilateral activity, and the muscular, arthrodial and tactile impressions of space and position must be immensely increased. Until this process of involuntary education is well advanced, it is not surprising that the individual experiences occasional vertigo and ataxia, though he does not exhibit nystagmus and may show no constant tendency to fall in any given direction.

CLINICAL MANIFESTATIONS OF VESTIBULAR PARALYSIS: We know that the onset of diffuse suppurative labyrinthitis or the removal of one labyrinth is invariably followed by very severe vertigo and disturbances of equilibrium,—these symptoms being the result of hyperactivity of the sound, unopposed labyrinth. In other words, sudden destruction or removal of one labyrinth is in effect equivalent to irritation of the remaining sound vestibular apparatus. After these symptoms of vestibular irritation have completely subsided, the patient is comparatively comfortable. He has now passed the stage when sudden movements of the head cause nystagmus and its attendant phenomena, and may be up and walking about his room. On getting out of bed in the morning, however, and on making any sudden and pronounced changes in the position of his body,—e. g., as in stooping over to pick up something from the floor, or even on suddenly rising from the sitting posture,—he becomes momentarily dizzy, and may even require support to prevent his falling. These symptoms are due solely to defective orientation, and though at first occurring frequently, are very slight as compared with the prolonged and distressing rotary vertigo of the acute stage. The attacks grow rapidly less pronounced, and may apparently cease within a few days, so that the patient is led to believe himself cured. He is likely, however, to experience a severe recurrence on attempting any physical act to which he has not re-accustomed himself. For example, when he first attempts to walk down an inclined plane, —e. g., in going down stairs,—he may experience sudden and severe

vertigo, due to the sudden call upon his still defective faculty of orientation by this new situation; and this may cause him to fall. Having had this experience, he calls into compensatory activity certain other senses,—chiefly the muscular and arthrodial senses and the sense of sight,—and soon learns to go up and down stairs without fear or danger. Again when he first attempts to walk in the dark,—e. g., in getting out of bed at night,—he may lose all sense of direction and may fall; and now must re-learn to maintain his equilibrium without the aid of sight.

All of the above manifestations of impaired orientation in the latent stage of suppurative labyrinthitis were demonstrated in the single case of a young physician on the house staff of the Manhattan Eye and Ear Hospital who was under the care of Dr. Duel. The same patient, having re-learned many of the common acts, such as stooping over, going up and down stairs, etc., was strolling along the street, and suddenly looked up at a tall building then in the process of erection. This deprived him of his sense of position or balance and he fell backward.

Even more typical of the vertigo of vestibular paralysis was a case which came under my care at the Manhattan Eye and Ear Hospital nearly two years ago. The patient, a man of 28 years, had contracted syphilis seven or eight months previously, and some five weeks before I first saw him, had become suddenly and absolutely deaf,—first in the left and then in the right ear.

Examination revealed the following condition:—Both drum-membranes practically normal; absolute deafness of both ears, both by aerial and by bone-conduction. Caloric reactions absolutely negative. The patient, seated upon a revolving chair, was rotated rapidly first in one direction and then in the other, with perfectly negative results,—i. e., there was no nystagmus, and the patient experienced absolutely no vertigo or discomfort. Clearly we had to deal with a patient both of whose labyrinths were absolutely non-irritable. Yet this patient complained as much of vertigo as of the deafness. Tests of his equilibrium demonstrated a type of ataxia presenting the following interesting contrasts with the ataxia of vestibular irritation:—He walked with marked unsteadiness,—i. e., with a somewhat tottering gait, keeping his eyes persistently on the ground before him. Asked why he looked on the ground, he said, "to keep from falling." Yet he was able to keep a straight course and walked wherever his will directed. With eyes closed and feet approximated (Romberg), he was able to stand steadily. In walking with eyes

closed, his unsteadiness was greatly exaggerated, but he still contrived to maintain a fairly straight course.

As differentiating the ataxia in this case from that characteristic of vestibular irritation, this patient exhibited no nystagmus, complained of no sense of rotation, showed no tendency to fall in any given direction. He walked laborously and with some difficulty, compelling his muscles to carry him where his will and sight directed.

The patient was admitted as a ward patient, where his symptoms were studied by some of my colleagues as well as myself. He never showed any signs of returning hearing, but his improvement in orientation was progressive and marked, so that when I last saw him, his gait presented no peculiarities which would attract the casual observer. In this he illustrated the rapid development of the muscular and arthrodial senses under the spur of necessity.

It sometimes happens that a case studied carefully at the time presents symptoms which are correctly interpreted only in the light of later experience. I mention by name such a patient, because her case was carefully studied by some of my hospital associates. Selena Miller, a girl then of 14 years, was admitted to the Manhattan Eye and Ear Hospital in November, 1908, with the following history: In July, four months previously, a radical operation had been performed on the right ear by a competent surgeon. The suppurative process had not been relieved thereby, and she had been re-admitted to the hospital on account of failing health and atypical symptoms of disturbed equilibrium. In the hospital she rapidly lost strength and flesh, and soon became rather apathetic and practically bed-ridden. When induced to get out of bed, she could not walk without support. Support being withdrawn, she was apparently unable to maintain her equilibrium, and would fall. There was no constancy in the direction of her falling, and the character of her ataxia seemed so atypical that she was suspected of being a quasi-malingerer, and transferred to St. Luke's Hospital. After her retention there for some days, she was returned to the Manhattan, no diagnosis having been made. On careful re-examination of the ears, it was found that the right ear was absolutely deaf, and gave absolutely no response to the caloric test. On exposing the old wound, I found a fistula leading into the horizontal canal and granulation protruding from the open oval window. Following a typical labyrinthine operation, she made a fairly rapid recovery with relief of all ataxic symptoms.

The interesting feature in this case was the peculiar and excessive form of ataxia, which can be satisfactorily explained only on one hypothesis: She had suffered suppurative destruction of one labyrinth; she was a delicate girl and the effect of a rather prolonged illness had been to reduce to an unusual and remarkable degree her muscular force and control. In the latter condition, her muscular and arthrodial senses were so far below par as to have failed utterly in compensating for the disturbed labyrinthine balance. Hence the patient's inability to stand or walk, and her liability to fall in any direction according to the chance position of the body. The disappearance of the ataxia cannot in this case be logically ascribed to the removal of the diseased and already non-functionating labyrinth, but rather to the relief of an extensive suppurative process, elimination of which enabled the patient to regain her muscular strength and tone, and her muscular and arthrodial senses to resume their rôle in the complex function of orientation.

The following case, which is the last I shall refer to, was in no wise unusual clinically. It will therefore serve the better to illustrate the point I wish to make, viz.,—the great importance of recognizing these defects of orientation and their resulting phenomena as belonging logically among the late clinical manifestations of the disease.

L. M., 34 years of age, a carpenter, was admitted to the Manhattan Eye and Ear Hospital in May, 1910, suffering from chronic middle-ear suppuration plus chronic suppurative labyrinthitis of the left ear. The labyrinth lesion was of long standing and the ear absolutely deaf and quite irresponsive to the caloric test. For this, a combined radical and labyrinth exenteration was performed. The immediate result of the operation proved that the static labyrinth was not wholly non-functionating, for he suffered a few days of characteristic vestibular symptoms,—i. e., rotary nystagmus, vertigo, etc. These quickly subsided, and the patient was soon up and about, and left the hospital to continue treatment in the dispensary. Some two months after the operation, while still under treatment for a slight discharge, the patient stated that he was in need of money and asked if he could take up his work as a carpenter, stating that he felt perfectly fit. I told him to do so, only cautioning him to make no arrangements which would prevent his coming regularly for treatment. The patient was a light-hearted, optimistic Italian, but when I next saw him he was deeply despondent. He

told me that he had arranged to take up his work, but had been obliged to surrender it by the frequent attacks of dizziness which overcame him.

I had little difficulty in assuring him that his trouble was only temporary and would assuredly wear off in time. But while reassuring him, I had time to consider the rather serious possibilities of such a case. Suppose that this man had been a builder's employee whose occupation required him to perform his work while standing upon a scaffold suspended high in the air. It is not difficult to imagine what might have resulted from an attack of vertigo for which he was wholly unprepared. Suppose that we are called upon to operate for diffuse suppurative labyrinthitis in a boy, and after all spontaneous symptoms have passed, allow him to resume the practice, dear to the heart of most boys, of diving into the river or swimming-pool. May he not drown before he can recover from the vertigo and ataxia dependent upon a sudden disturbance of orientation?

The type of vertigo which I have endeavored to describe naturally shows some variation in different individuals. This form of vertigo being ordinarily induced only by unusual demands upon the disabled mechanism of orientation, there are undoubtedly individuals whose muscular and arthrodial senses are far below the normal average of efficiency, and who, after destructive labyrinthitis, logically experience for a considerable period a mild grade of vertigo and ataxia of more or less constant type.

To recapitulate: The point I wish to make is that there are two distinct forms of labyrinthine vertigo and associated ataxia,—one the familiar spontaneous type, due to vestibular irritation and occurring only during the acute stage of suppurative labyrinthitis; and the other not spontaneous, not constant, not necessarily accompanied by nystagmus, characteristic only of the latent, or quiescent, stage of the disease, and induced solely by sudden and unexpected calls upon the lost or defective orientation-sense, in the maintenance of which the intact vestibular organs are normally so important a factor.

58 West Fifty-sixth Street.

A REPORT OF ELEVEN CASES OPERATED UPON BY THE YANKAUER METHOD FOR CLOSURE OF THE EUSTACHIAN TUBE.*

BY SAMUEL MC CULLAGH, M. D., NEW YORK.

It takes much patience, many years and a campaign of education to eradicate an erroneous opinion—political, religious or medical—that has been handed down through successive generations. That a chronic discharge from the ear is a symptom of slight moment is still firmly fixed in the minds of the laity and, unfortunately, in the minds of much too large a percentage of physicians. Such being the case it is very often most difficult to obtain consent to the performance of any operation,—the radical especially,—for the relief of this condition. When consent is obtained the operation is usually regarded by the friends of the patient at least, if not by the patient himself, as one of complaisance and not of necessity; and an unsuccessful result is often the cause of unwarranted and unjustified reflections upon the skill and ability of the attending otologist.

For ourselves, the indications for the radical operation have become more restricted and our enthusiasm has abated, so that the performance of this operation is not as promiscuous as formerly. The fact that failure to stop the discharge, further impairment of hearing, facial paralysis and secondary intra-cranial complications, have occurred even in the practice of the most skillful surgeons may be responsible for this. Disregarding the possibility of these post-operative complications, even when we feel that a radical operation would make the patient safer, some of us may still hesitate on account of the possibility of failure with the attendant unpleasant results already referred to. Perhaps this is not so important a factor to those who practice in the larger cities as to others where failure, like success, is more widely heralded.

Thus we have two classes of cases with chronic discharge from the ear,—those who refuse operation, and those to whom we refuse operation as not being an absolute necessity, where a minor operation which would cure them would undoubtedly,—to borrow an advertising phrase,—"fill a long-felt want."

The operation devised by Yankauer for closure of the Eustachian tube at the isthmus is such an operation fortunately not restricted

*Read before the Annual Meeting of the American Rhinological, Laryngological and Otological Society, Atlantic City, June 3, 1911.

to these classes alone and is successful in a percentage of cases. It does not replace the radical operation, but does, perhaps, further restrict its application. The results of this operation in my hands show, comparatively speaking, a small percentage of successes, but I feel that the gain made in saving this proportion from a radical operation is a marked advance in the conservative treatment of this disease, as otherwise practically all these cases would have been operated upon radically if I had obtained permission.

In the selection of cases for operation by me only two factors were taken into consideration: first, that no labyrinthine involvement was present; second, that the discharge had been of long duration and had refused to yield to local treatment.

In one case operated upon (Case 3), anesthesia was induced in the manner recommended by Yankauer, namely, the application of cocain and adrenalin to the tube by means of his applicator and to the middle-ear through the perforation. In the other cases, with the patient lying on the well side, a ten per cent solution of cocain was poured into the ear and by pressure on the tragus was forced into the tube. The anesthesia was perhaps not as absolute by this method but was very good.

I shall not take any time in a description of the technic of the operation, with which you are all undoubtedly familiar. I will say, however, that in all my cases the introduction of the curet was very easy, although I had anticipated difficulty in accomplishing this step of the operation. In none of the cases operated upon was I able to invert the mucous-membrane of the tube in a single piece. In only one case was ossiculectomy done at the time of the operation, (Case 3). I now feel that this was a mistake, and that the ossicles should always be removed when present. The following case-histories I have purposely reduced to skeleton outlines:

Case 1. W. S., male, aged 19. August 20, 1910: Was discharged after a radical operation with complete epidermitization. September 1: Tube has broken down, and is discharging. September 6: Yankauer operation. September 10: Tube dry. May 18, 1911: Dry.

Case 2. W. S., male, aged 19. Radical operation two years ago with persistent profuse discharge of thick, stringy muco-pus from an unhealed tube. September 10, 1910: Yankauer operation. February 11, 1911: Discharge persists, but very much less in amount.

Case 3. W. H. O., male, aged 21. Scanty, foul-smelling discharge for many years unaffected by local treatment. Patient requested a radical operation. The perforation was in Shrapnell's

membrane. September 7, 1910: Ossiculectomy and Yankauer operation. October 19: Ear dry. May 1, 1911: Ear still dry.

Case 4. A. A., female, aged 12. Very foul discharge for the past seven years. September 15, 1910: Yankauer operation. May 20, 1911: Slight discharge. Foul odor has disappeared. Hearing much better than before the operation.

Case 5. M. M., female, aged 26. Discharge since childhood. Examination shows total destruction of the tympanic membrane. October 4, 1910: Yankauer operation. February 7, 1911: Discharge persists. Second Yankauer operation. May 18: Discharge slight, and very much less than before operation. Hearing much improved.

Case 6. E. K., male, aged 17. Profuse discharge for twelve years. Has been treated locally for the past six months. October 6, 1910: Yankauer operation. May 18, 1911: Discharge persists, but very much less than before the operation.

Case 7. S. C., male, aged 20. Moderate amount of discharge for the past ten years. Radical operation has been performed on the other side. January 14, 1911: Yankauer operation. February 16: Absolutely dry. May 18: Dry.

Case 8. A. J., male, aged 26. Recurrent discharge for many years, constant for the past two years, during which time he has been under treatment. Examination reveals a large perforation with the stump of the malleus remaining. January 24, 1911: Yankauer operation. Stump of the malleus not removed. February 2 and February 7: Ear dry. Peroxide gives no reaction. March 15: Small amount of discharge. April 17: Discharge persists. A small mass of granulation tissue apparently springing from the posterior border of the anulus noted. Cauterized. May 5: Discharge persists, but very slight.

Case 9. J. M., male, aged 21. Discharge since childhood. Has not responded to treatment. Examination shows a total destruction of the drum-membrane. March 2, 1911: Yankauer operation. March 9: Discharge persists. Patient then lost sight of.

Case 10. J. M., male, aged 18. Discharge since infancy. Has been treated irregularly for many years. Examination shows a large perforation in the anterior half of the membrana tympani and the probe revealed bare bone at the mouth of the tube. March 11, 1911: Yankauer operation and attempt to remove the necrotic bone entirely. May 20: Discharge persists, but is very slight.

Case 11. W. K., male, aged 24. Discharge for seven months. Has been under treatment for the past five months. Large per-

foration in the anterior inferior quadrant. March 11, 1911: Yankauer operation. May 2: Absolutely dry. May 20: Dry. In this case the effect upon the hearing was so marked as to be worthy of note: March 11:—Acumeter, 6 feet; Whisper, 5 feet; C_2, 7/13. May 2: Acumeter, 20 feet plus; Whisper, 20 feet plus; C_2, 10/15.

SUMMARY: The cases of which brief clinical histories have been given fall into two classes,—those in which a radical operation had been performed, and those in which no operative treatment had been undertaken. Of the two cases, in the first class (cases 1 and 2) one was cured and one improved; of the nine remaining cases (cases 3 to 11 inclusive), three were cured, five were improved, and one is classed as unimproved as he passed from observation. This shows 33 per cent cured, 56 per cent improved, 11 per cent not improved. Of the three cases cured in the second class of cases, the time elapsing between the operation and cessation of the discharge was: Case 3, six weeks; Case 7, four weeks; Case 11, six weeks. Of both classes combined, 36 per cent were cured, 55 per cent improved, 9 per cent not improved. Eliminating the case that was lost sight of, 40 per cent were cured and 60 per cent improved. In the cases noted as improved, all so classed have expressed their satisfaction at the result of the operation.

To attempt to draw any conclusion from such a meager number of cases would be useless. The results of the operation in my hands have certainly not been as brilliant as in Yankauer's, but undoubtedly this may be in large measure due to his superior technic. In conclusion, I merely wish to reiterate my belief that in this method we possess a very valuable and simple operation that will eliminate the necessity for a radical operation in a certain percentage of cases, and which should always be performed before resorting to the major operation unless some symptom demands a free exposure of the temporal region.

35 Park Avenue.

Diverticulum of Tracheo-bronchial Tree. KAHLER. *Monatschr. f. Ohrenh. u. Laryngo-Rhinol.*, Heft 1, 1911.

This article is a report of two cases of congenital diverticulum of the tracheo-bronchial tree. Both were of the type described by Chiari and designated by him as rudimentary bronchial branches.

ED.

REPORT OF CASES OPERATED UPON BY THE YANKAUER METHOD OF CLOSING THE EUSTACHIAN TUBE.

BY GAYLORD C. HALL, M. D., LOUISVILLE.

The Yankauer operation for the closure of the Eustachian tube in chronic suppurative otitis media has now been sufficiently described to justify the omission of the technic in a paper dealing with the subject.

Since it will take the report of many cases and in the hands of different men before an absolutely just opinion of the worth of the operation is possible, I wish to add my experience to those who have taken up this operation.

Without entering into a detailed critical examination of the various points for and against this procedure, the writer believes that the proposition is eminently logical and practical and that experience will further confirm this belief in the minds of the profession in general.

He further believes that emphasis should be laid upon the statement made by Yankauer in his original communication, that it is those cases in which otorrhea is practically the only symptom that are particularly adapted to this class of operation.

While it is possible to discuss this question in its various phases indefinitely, both as to the ability of the operation to cure and the various forms of the disease to which it is applicable, the writer believes that it is not a question for argument, but for demonstration, and that the true status of the worth of the operation will be obtained only through the reports of a large number of cases, both successful and unsuccessful, and in this manner alone shall we be able to know what class of cases it will cure and in what class it will be unsuccessful.

With the hope of assisting in this respect the writer desires to report the following cases: Seven ears in six cases were operated upon. Of these, five were cured absolutely; in one case the operation was not done on account of failure to enter the tube; in another the operation was without effect on account of intra-cranial complications. The history of these cases is briefly as follows:

Case 1. Miss P., aged 26 years. Chronic suppuration since childhood following scarlet fever. Has practical absence of ear-

drum; Valsalva positive; is troubled with a constant discharge; treated both in childhood and adult life without result.

March 11, closed tube by Yankauer's method. There was slight reaction and pain following operation, but the purulent discharge ceased on the fourth day. The ear was dry on the tenth day.

Case 2. D. S., aged 34 years, seen January 26, 1911. Ears have run since childhood; have foul odor unless constantly cleaned; is somewhat deaf; recently has been having vertigo, which has interfered greatly with his work; also headaches, sometimes severe. His general health is good. Examination shows large holes in both ear-drums, Eustachian tubes open. I used cleansing and alcohol drops with little or no effect. On February 14, I closed the right tube. A slight reaction followed. The ear was dry in less than one month.

March 18, I closed the left tube. This ear was dry in two weeks. The patient had a considerable increase in hearing-power together with entire relief of the discharge.

Case 3. Mr. H., has had a discharge from his ear at varying periods all his life. On December 6, 1910, he was seized with great pain inside of the head; also vomiting and vertigo. He is totally deaf in the affected ear, and had a profuse discharge with blood, following the attack. Now he is dizzy. There is a foul discharge; drum membrane destroyed. There were polyps in the external canal. The polyps were removed and a mastoid operation advised. This the patient absolutely refused and the obliteration of the tube was suggested with little hope that it would accomplish a favorable result. The operation seemed to be without result.

Case 4. Miss G., aged 30 years. Ears have discharged since childhood, following scarlet fever at 8 years. She has had earache and discharge intermittently. When seen she had a slight discharge with bad odor all the time, with occasional acute exacerbation. The treatment partially controlled the symptoms, but the ears continued to discharge. On April 14, obliteration of the Eustachian tube, right side. In five days only slight moisture was present, ear afterwards becoming dry.

Case 5. M. T., aged 38 years, first seen in 1908. He had been deaf for some time and for the past three months had running ear with foul odor; no pain or headache. Ear had discharged for many years. The patient cleans out cisterns and wells; thus being exposed to dampness. In the right ear there was a large perforation and the canal was filled with foul pus. I treated him and

temporarily controlled discharge. He returned May 3, 1911, with ears as before. On May 4, I closed the Eustachian tube and on May 10, the ear was practically dry.

One case in which the operation was not performed was postponed on account of the nervousness of the patient and my unwillingness to cause her any pain. This case was induced to undergo the radical operation at the hands of another man. Case 3 recently returned and exhibited a portion of the cochlea that had been cast off. He still defers operation.

Analysis of these cases shows that a cure resulted in practically every case that Yankauer says is particularly suited to this operation. One case where the operation was not performed through failure to enter the tube cannot properly be classed as a failure of the operation; and the other case unrelieved was clearly unsuited for the operation and the patient was so informed before the work was done, so that this cannot properly be classed as an operative failure.

In none of the cases has the tube subsequently re-opened nor has the ear become infected in any way. The tube did re-open in a case operated on for profound deafness by closing the tube after excision of the drum. Here the ear became infected after several weeks and a profuse discharge resulted. The ear was again operated with resulting cessation of the discharge. This accident is a fault in the performance and not in the conception of the operation, but we should remember the possibility of its occurrence and strive to prevent it by thorough curetting at the time of the operation.

While it is true that there are but a few of these cases reported and the operation has been done at but a recent date, the writer believes firmly in the permanency of the cure: first, because there is the analogy to Dr. Yankauer's own cases; secondly, because the result was brought about without any other form of treatment and that long-continued medication that failed to influence the cases previously, and finally, because of the altered appearance of the middle-ear as a result of this procedure, which betokens a change not found in any other method of treatment.

Gaulbert Building.

SOME OBSTRUCTIONS TO SPEECH-DEVELOPMENT.*

BY G. HUDSON-MAKUEN, M. D., PHILADELPHIA.

The tendency toward the development of speech seems to be an inherited one, and when even in the first year a child fails to exhibit indications of this tendency, we may be sure that there is something wrong. It is not always easy, however, to determine just what the difficulty may be, and it is of the various possible reasons for delayed speech-development that I wish to speak to you, adding a word of suggestion, perhaps, as to the best methods for removing them.

Speech has been defined as "a system of articulate words adopted by convention to represent outwardly the internal processes of thinking"; but speech does more than this, for it not only represents the internal processes of thinking, but it is so closely interwoven with them as to be absolutely essential to their development. Speech is also one of the essentials to the highest physical deevlopment, for its use tends to strengthen some of the most important muscles of the body, to expand the lungs and aerate the blood. Deprive a child of speech, therefore, and you deprive him of one of the most important tools of the mind, as well as one of the most important exercises of the body.

The faculty of speech is presided over by delicate and complicated cerebral areas inciting to action, and working in harmony with, peripheral organs having other important bodily functions in addition to those of voice-and speech-production. Defective speech, therefore, having its origin in a defective action of some of these important central areas and peripheral organs, is a serious malady and deserves most careful consideration.

In order to have a clearer understanding of the subject, and at the risk of being too elementary in my talk to you, allow me to refer briefly to the various mechanisms of speech.

For purposes of study, the mechanisms of speech may be divided into two general classes, the central and the peripheral mechanisms. The peripheral mechanisms are three in number, namely, the respiratory, phonatory, and articulatory mechanisms. The respiratory mechanism, with its large muscular attachments, furnishes the motor power for speech, which, together with the phonatory mechanism, produces the material of which speech is made, namely,

*An address delivered before the Teachers' Association of the Pennsylvania School for the Deaf, at Mt. Airy, Philadelphia, Pa.

voice. The articulatory mechanism not only modifies the character of voice, but it also molds and articulates it into the symbols, which in their different combinations represent intelligible speech.

The three peripheral mechanisms constitute what may be called the physics or mechanics of speech, and their normal action and development depend, first, upon their structural adequacy, and second, upon their control by the higher central mechanisms situated in the brain and spinal cord.

Among the structural conditions of the peripheral mechanisms that may interfere with the development of speech in children may be mentioned, first, deformities of the thorax, interfering with respiration and breath-control in general; second, deformities with tumors of the larynx, interfering with the production of voice, which is the essential element of speech, and third, the numerous irregularities of structure, and pathologic conditions in the mouth, pharynx, nose, and ear.

Deformities of the palate, including the alveolar arches and teeth, are frequent causes of faulty speech-development in children. The speech resulting from a cleft palate is characteristic, and it is well known because of its pronounced and conspicuous nature; but the lesser deformities of the palate and irregularities of the teeth, while equally as positive, are not as easily recognized, because their results are manifest only to the trained ear. As is well known, the cleft, or so-called hare-lip, also frequently accompanies deformities of the palate, adding materially to the difficulties of normal speech-development.

Deformities of the tongue have long been recognized as obstructions to speech-development, but the importance of some of them, I think, has been overestimated. The large, unwieldy tongue of the cretinoid child and of the Mongolian type of imbecility and idiocy is well known, and it is undoubtedly to some extent a cause of the defective speech in these unfortunate individuals; but it is probably quite as much a result of their lack of speech-development as a cause. The large tongue, however, is not always a mark of imbecility or even of feeble-mindedness, for it is sometimes found in an otherwise normal child, and the scientific name for it is macroglossia.

A short lingual frenum, or tongue-tie, has been and is now regarded by many as being the chief cause of the lack of speech-development in young children; but from my own experience I conclude that a short lingual frenum has but little effect upon the character of the speech. It does, to be sure, tend to bind the tip of the

tongue down in the floor of the mouth, and to limit its action; but is it not a fact that more disorders of speech result from too great activity of the tongue than from too little? In order to limit the activities of the tongue, many teachers now advocate the holding of it down against the lower teeth during the emission of the labio-dental and palatal sounds. Notwithstanding this fact, however, it is quite possible that a short lingual frenum may so hamper the normal action of the tongue in young infants as to make it figure to some considerable extent in the causation of delayed speech-development.

Mechanical obstructions to the development of speech may be looked for also in the pharynx, and among these enlarged tonsils and adenoids are the most frequent. Moreover, these abnormal pharyngeal growths interfere with the development of speech psychically as well as physically, and therefore they assume a two-fold importance. I am inclined to think that the psychic influences brought about by the respiratory and circulatory disturbances which result from enlarged and diseased tonsils and adenoids are greater, so far as speech is concerned, than the mere mechanical obstructions coming from these sources. The general health, also, of the otherwise not-too-strong child may be so greatly impaired by these conditions as to render him incapable of psychic development, and therefore the speech naturally must suffer in consequence.

Intra-nasal obstructions also tend to impede normal speech-development in a somewhat similar manner, depriving the child of sufficient oxygen and interfering with the normal development of the general respiratory system. No one of the mechanisms of speech can escape the deleterious influences of faulty nasal breathing. The respiratory mechanism suffers by a lack of development and by the more or less constant congestion and resultant catarrh of the mucous membrane, which always accompanies this condition. Rhinitis, pharyngitis, laryngitis, and bronchitis are common in such cases, and these conditions render speech difficult and in some instances quite impossible to the average individual. Moreover, the ill effects of intra-nasal obstructions and intra-nasal pressure upon speech and voice are progressive in their character and increase with the age of the patient. This is more especially true when the trouble arises from deformities of the septum rather than from hypertrophies of the turbinate bones, because the hypertrophies tend to atrophy in later life, and thus nature comes to the relief. The nasal operation, therefore, most frequently indicated in adult life is generally one for the correction of a deformity of the sep-

tum; and, unfortunately, the older the patient grows the greater the discomfort and the greater the injury to the speech from such a condition. This, I suppose, is in accordance with the principle that the vigor of youth enables one to overlook and overcome conditions which become a real annoyance and even an obstruction to progress in later life.

It is not alone the obstruction to breathing which arises from these nasal deformities that is prejudicial to normal speech-development; but the intra-nasal pressure which often accompanies them is a factor of almost equal importance.

I have been impressed with the large number of stammerers, for instance, who have intra-nasal pressure, and whose speech-defect, I am convinced, is greatly aggravated by this condition. If we look upon stammering as a neurosis—and I think that it may be so regarded in many instances—we may not be going far amiss in attributing its origin to a reflex disturbance arising from pressure within the nose.

We come now to the most important of all obstructions to speech-development, namely, disorders of the ear and the resultant hardness of hearing and deafness. If we keep in mind the fact that the ear is an integral part of the respiratory tract, being merely an extension of the naso-pharynx, with highly specialized functions, we shall be in a position to understand some of the conditions of this organ which tend to disturb its two important functions, namely, the function of hearing and the function of equilibrium, the former of which, of course, will especially concern us at this time.

The ear, as I have said, being an extension outward and upward on either side of the naso-pharynx, is subject itself to the various inflammatory conditions common to this region, and it partakes oftentimes of the results of the diseases of those portions of the upper respiratory tract which are nearest to it, namely, the nose and pharynx. This explains why intra-nasal obstruction and pressure and hypertrophied tonsils and adenoids so often affect the ear, and why they become the chief causal factor in the various diseases of this organ.

Earache, for instance, a condition which depends upon an acute inflammation of the middle portion of the ear, is almost always due to so-called colds in the head, which are in turn the direct results of nasal obstruction and hypertrophied tonsils and adenoids. These acute attacks, if not carefully treated, result, of course, in chronic inflammation and discharge from the ear, with mastoid complications and more or less destruction to the aural mechanisms, whose

function it is to conduct the sound-waves to the inner ear and thence through the auditory nerve to the centers of hearing in the brain.

My whole hour, of course, would scarcely suffice accurately to describe to you the delicate and beautiful structures which combine to form the mechanisms of the ear, and the various diseases which attack them. I have described briefly to you the peripheral organs of speech and I have referred to the chief disorders of them which result in obstructions to speech-development, and it now remains to speak of the central mechanisms of speech and some of the causes which lead to their faulty development.

The central mechanisms of speech are four in number, namely, the auditory, the visual, the glosso-kinesthetic, and the chiro-kinesthetic centers, or the centers for hearing, seeing, speaking, and writing words. It seems to me that it would simplify our study of the cerebral mechanisms of speech to add still another center, namely, the tactile center, although this could scarcely be so definitely localized as the others, because the tactile speech-centers are more widely distributed throughout the cerebral cortex.

The auditory speech-center is merely a differentiated or specialized portion of the so-called general auditory center. It is the particular point at which word images are registered in the brain, to be afterward revived or recalled for purposes of voluntary speech. Hearing, therefore, is essential to the natural development of the auditory speech-center. The untaught deaf child has no development of the auditory speech-center. He has no registration of word-images, and therefore he cannot learn to speak in the usual manner. The partially deaf child, on the other hand, has distorted word-images, because he hears words inaccurately, some of the important elements which enter into their formation escaping him entirely. Moreover, the accurate formation of word-images in the auditory center of the brain depends in great measure upon the child's ability accurately to phonate and articulate words, because the formation and registration of word-images take place simultaneously with the development of the words in speaking. It may be said, therefore, that the child must speak the word before the formation of the image in the auditory center can be completed, and if for any reason, peripheral or otherwise, the word is inaccurately spoken, it will gradually come to be inaccurately registered and the image will be a distorted one.

It is this fact that prompted me some time ago to write a paper entitled "Do we hear ourselves as others hear us?" which question

I answered in the negative. I tried to show that we do not hear ourselves as others hear us, but each of us has individual standards of speech which differ from those of all others, and our own speech is as near as we can make it an exemplification of our own standards. No one has ever spoken better than he knows, and for one to improve his speech, he must elevate his standards of speech.

The totally deaf child, as I have said, develops no auditory word-images, and the partially deaf child develops distorted word-images. Now I wish to emphasize the fact that a child may have normal hearing-power and yet, owing to some obstructions in the other peripheral or central mechanisms of speech, he may, like the totally deaf child, develop either no word-images at all, or, like the partially deaf child, he may develop distorted ones. In other words, the development of word-images depends in large measure upon the child's mental and physical ability to produce words.

I have described the various conditions of the peripheral organs which may lead to faulty speech-development and to distorted word-images, and it remains now to speak of the cerebral conditions which may have precisely the same effects.

When a person speaks spontaneously, the cerebral processes are somewhat as follows: (1) Ideas are aroused; (2) from the mental operations conducted with the help of these ideas a resultant product issues; (3) the product is clothed in words; (4) the central innervations necessary for their externalization are brought about; and finally (5), these innervations are conducted to the peripheral organs of speech in their proper order and intensity. Spontaneous speech, therefore, requires for its production more than the mere storage of word-images in the auditory word-center. It requires, first of all, the arousing of ideas and the issuance of a resultant product from certain mental operations conducted with the help of these ideas.

The mentally deficient child, therefore, cannot speak accurately or connectedly, because he has no well-defined ideas with which to conduct the mental operations necessary to the formation of the resultant product. He has no resultant product, even if he had words with which to clothe it. Again, other subnormal children may be mentally alert; that is to say, they may be able to arouse ideas and conduct with them the mental operations necessary for the issuance of a resultant product, and they may also have a good supply of word-images in their auditory word-centers with which to clothe their resultant product, yet they may be entirely unable to arouse the innervations which are necessary for the externalization of

words; or, having aroused the necessary central innervations, they may be unable to conduct these innervations to the peripheral organs of speech in their proper order and intensity.

This brings us to a study of the glosso-kinesthetic center, or the so-called Broca's motor center of speech. As the term kinesthetic suggests, we have stored in this center memories of the movements of the peripheral muscles in the production of speech. The child who does not hear speech, as I have said, will have no differentiated auditory word-center, and therefore he cannot, of his own accord, learn to speak. Moreover, the child who has not learned to speak can have no glosso-kinesthetic speech-center or memories of the muscular movements necessary for the development of speech. The child having defective speech, on the other hand, will not only have distorted auditory word-images, but he will also have defective kinesthetic memories of the muscle-movements necessary for the production of words, and the correction of his defective speech consists in the correction of his defective kinesthetic word-memories and through them the correction of his distorted auditory word-images.

The auditory center and the glosso-kinesthetic center are the two centers chiefly employed in speech, and together they have been called the primary speech couplet. The centers employed in reading and writing are the visual and the chiro-kinesthetic centers, and as reading and writing are closely allied to hearing and speaking, this secondary couplet is also connected with the primary couplet by so-called commissural fibers. This explains why it is that in normal hearing-children, the eye may be used to some extent as well as the ear in the development of speech, and the act of writing is generally acquired after the child has learned to speak and read. Writing, however, being accomplished by the larger muscles of the hand and arm, is a voluntary act, and, unlike the development of speech in the hearing-child, it is acquired by long and painstaking voluntary effort.

In the normal development of speech, as we have seen, the child, after hearing words, attempts to imitate them, and he checks up the results of his efforts by drawing a mental comparison between his own subjective hearing of them and his original objective hearing of them. In this manner he finally forms his individual standards of speech. These standards, as I have said, differ in different individuals; but each one's own standards are generally quite satisfactory to himself.

Let us consider now what takes place in the brain of the totally deaf child when we teach him to speak. We may suppose that

many deaf children, like hearing children, are possessed of an inherited tendency to speak, and this fact, of course, greatly facilitates our work with them. Indeed, I have no doubt but that if deafness could be detected in children as early as the beginning of the second year, and if training in speech-and lip-reading could be systematically and vigorously begun and carried on at that time, we could get much more satisfactory results than according to our present methods. It is in the second year that the inherited tendencies toward speech-development are most pronounced, and it is during babyhood that perhaps the greatest attention is given to the development of these tendencies in hearing children; but as soon as it is found that children are deaf, we all begin immediately to neglect them and in many other ways to spoil them. If my own child were deaf, I think I would talk to it and have it talked to all the more because of its deafness, and thus even in the first year try to have it learn lip-reading and to have it continue to develop voice and speech from the small beginnings which even deaf children make in the way of crying, babbling, prattling, etc.

When we teach the deaf to speak, as I have said, we are handicapped by the absence of any development whatsoever of the auditory speech-center. The child has no hearing for speech, either subjective or objective, and we must therefore substitute some other sense or senses for that of hearing. I have explained to you how even in hearing children the visual sense may be used to some extent in the development of speech, and you know that the tactile sense is also made of great service. In teaching the deaf child to speak, the tactile sense is of the first importance, for it must take the place which the hearing sense occupies in normal children. I would substitute, therefore, for the auditory center in our diagram the tactile center, and this would give us a scheme for studying the cerebral operations in the development of speech in the deaf.

SUMMARY.

Human speech has been called the greatest of miracles and the wonder of creation. "In the beginning was the Word, and the Word was with God and the Word was God." Even before thought and reasoning were possible there probably existed the word, and man thus became exalted above the brute creation and was made only a little lower than the angels. A study, therefore, of the obstructions to the development of speech and methods for their removal would seem to be worthy of our best efforts.

The chief obstruction to the normal development of speech, of course, is deafness, because hearing is absolutely essential to the

natural and automatic development of the cortical speech-centers. The functions of the ear, therefore, should be carefully guarded, and every possible means should be employed for their development, because even a little hearing is better than no hearing at all.

Deformities of the mouth, pharynx, and nose, as well as those of the larynx and the respiratory organs, are in themselves prejudicial to normal speech-development, and they are frequently the direct cause of the various diseases of the ear which result in hardness of hearing and oftentimes in deafness. Deafness, as I have stated, is the chief obstruction to speech-development, because it interferes with the normal cerebral development, and speech itself is more cerebral, or cortical, than peripheral. That is to say, if the speech-centers in the brain are normal in their development and action, fairly good speech may be produced with very imperfect peripheral mechanisms. Intelligible speech has existed, for instance, after the complete removal of the tongue and even of the larynx, and a cleft palate affects the speech only to a certain limited degree.

So much is speech a product of the brain that the articulatory muscles have been called the mental muscles. Good speech cannot issue from a brain diseased, but it is the result of the fullest development of the higher intellectual centers of the brain. The lower speech-centers which I have described can work effectively in the externalization of speech only when they are controlled by other and higher centers situated in the fore-brain. Feeble-mindedness, therefore, imbecility, and idiocy are incompatible with good speech-development, because without normal intellectuality and mentality there can be no normal development of the lower centers and peripheral organs of speech.

All speech-training, therefore, whether the defects be on account of deafness or on account of the thousand and one other things that may impede its development, must be carried on simultaneously with psychical training. Speech-training consists, after all, only in an effort to help the individual by means of the development of the higher intellectual centers of his brain himself to control and train his lower speech-centers, and thus through them the peripheral mechanisms of speech. All children should have a certain amount of speech-training, and thus not only would the expression of thought be placed upon a higher plane, but that portion of the brain which manufactures thought would be itself more highly developed.

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THE ORO-PHARYNX AS A PORTAL OF ENTRY FOR INFECTION.*

BY L. F. FRISSELL, M. D., NEW YORK.

In discussing the mouth and pharynx before the laryngological section, a medical man's function is obviously to confine himself to those general diseases which obtain access to the body through diseases in these cavities, but in a consideration of the lymph nodes of the oro-pharynx as a portal of infection a brief resumé of the anatomy is necessary. The tonsil, to take the best-known of the pharyngeal lymph-nodes as an example, has as its unit the lymph follicle covered with mucous membrane, and subdivided by infoldings of this membrane, the lining-epithelium of which is in many places deficient. Otherwise the structure is in all respects that of an ordinary lymph-node except as regards its lymph channels. Efferent vessels are present, but afferent are absent. Their place is, however, to some extent taken by the deficiencies in the lining mucous membrane of the crypts which are thus in direct communication with the inter-follicular lymph-channels.

The distribution of the lymphoid tissue in the pharynx is peculiar. We find the combined opening of the digestive and respiratory tubes almost completely surrounded by lymph-tissue, the so-called "Ring of Waldeyer," composed of pharyngeal, faucial and lingual tonsils and a lateral pharyngeal chain on each side. Thus at a point where ciliated epithelium is not yet present to protect by sweeping out invading micro-organisms and the protective action of the saliva in inhibiting bacterial growths (Albert and Mills[1]) is no longer present, we have this curious formation of lymph tissue encircling the whole entrance to both digestive and respiratory tracts. This brings us at once to that mooted point, the function of the tonsillar-pharyngeal lymph tissue which may be approached from several sides. That it is not a vestigial remnant the work of Retterer[2] seems to prove. It is not existent in reptiles until the crocodile stage is reached and attains great complexity only in the higher mammals. Presumably a recently acquired organ has some function. The natural supposition is that it shares the function of lymph glands in general in the formation of lymphocytes and in protecting the body against the invasion of bacteria. Wood[3] and

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Ravenal have tested the bacteriolytic action of an emulsion of tonsil with negative results. They attribute their failure to find such properties to a removal of antibodies by repeated absorption into the blood and lymph streams. The question as to how the tonsil may act as a portal of infection may perhaps be answered as follows:

First, through the blood stream, a local affection of the tonsillar mucous membrane such as diphtheria or follicular tonsillitis, produces in a few hours marked constitutional disturbance. This is most readily to be explained by the assumption of a speedy absorption of toxins through the vascular walls directly into the blood-stream and is well exemplified by the difference in constitutional disturbance of pure laryngeal and pharyngeal diphtheria. In the first case the constitutional disturbance is comparatively late, in the latter case early. In this connection, however, it must be remembered that Adami and his pupils believe that bacteremia is much more common in local disease than has ordinarily been supposed.

Second, infection through the lymph stream. This is probably a somewhat more uncommon method though some infection takes place in the majority of cases of tonsillitis as evidenced by the enlargement of the gland at the angle of the jaw and sometimes of the deep cervical chain. Goodale,[4] Hodenpyl,[5] Hendelsohn,[6] Wood[7] and others have worked upon this subject and prove that foreign material, carmine, ink, etc., can be absorbed from the tonsillar mucous membrane and crypts and found in the tonsils and lymph glands within a short time after injection. Wood, in particular, has made careful injections and dissections and finds a gland constantly situated just below the anterior border of the sterno-mastoid where it is crossed by the posterior belly of the digastric muscle. The superficial glands are not involved and the further connection is with the anterior chain of deep cervical glands, the lymph and foreign matter being finally emptied into the jugular lymph trunk and so into the junction of the jugular and subclavian veins.

Obviously, bacteria can much more readily follow the lymph channels than such gross materials as carmine, ink, etc., and often pass through the mucous membrane and faucial lymph tissue without local lesion to find resistance farther down in the lymph glands. This point has been well proven in studies on the analogous infections of the bronchial and mesenteric lymph nodes without antecedent disease of lung or intestine. It seems equally reasonable to attribute disease of the cervical glands to infection through the various drainage-areas of the glands involved.

The diseases which gain access to the body through the oro-pharynx may be divided in two main types. First, those local infections which cause constitutional disturbance by toxin absorption, of which diphtheria is the best example and which needs in this connection no further explanation. Second, those diseases caused by an invasion of the body by bacteria. Of these, the most common are tuberculosis and the various forms of septic invasion of the body by pyogenic organisms. Rheumatism may perhaps be caused either by toxin or bacterial entry. We have no definite proof of either but strong evidence of the existence of one of these etiological factors.

The status of the tonsil and the pharyngeal lymph tissue in its relationship to tuberculosis is one of great interest and has been approached both from the side of local tonsillar disease in pulmonary tuberculosis and in the etiological relationship of the faucial lymph tissue to cervical gland tuberculosis and even of apical pulmonary tuberculosis.

As would be expected in the case of organs with deep recesses constantly bathed with tuberculous sputum, the condition obtaining in the tonsil in the presence of advanced pulmonary tuberculosis, a large percentage of the cases show tuberculous tonsils. Strassman[8] finds the tonsils tuberculous in thirteen out of fifteen autopsies on tuberculous subjects, Domockowski[9] in every one of fifteen cases, Wood in a report from the Phipps Institute in twenty-nine out of thirty-seven cases.

The evidence of cervical gland-infection through faucial invasion but without local lesion is less direct but inferentially scarcely less clear. Animal experimentation shows that after inoculation at any point in the periphery with tuberculous material either a local lesion may result or the nearest lymph glands become tuberculous. Feeding experiments by Baumgarten[10] and Fessler[11] prove that after ingestion of the tubercle bacilli with an intact mucous membrane the lymph follicles of the gut are first affected and later the mesenteric glands. Only with the ingestion of large amounts of virulent bacilli are local lesions produced. Primary bronchial lymph-node tuberculosis is likewise produced by inhalation of dried tuberculous sputum. We thus see the possibility of the passage of the tubercle bacillus through the intact mucous membrane. In children, gland tuberculosis plays a very important rôle. Wohlgemuth finds that in children under ten, sixty per cent suffer from tuberculous glands. In an analysis of 430 cases, the same author finds that in ninety-three per cent of these the cervical glands were af-

fected. Following our rule in case of infections of a lymph gland to regard its drainage area as the portal of entry, we inevitably reach the conclusion that the oro-pharynx and particularly its lymph tissue is the site of invasion. Recent work by Grobe,[13] Beitzke[14] and Wood,[3] shows the occasional presence of a supra-clavicular gland-lesion connection with the cervical chain and hence an indirect possibility of apical involvement from the tonsil. This, however, must be a rare occurrence as the connection is not a regular one.

Septic invasion of the body has been reported in many cases by different authors. Stengel,[15] Woodcock,[16] Adler,[17] Otten[18] have all reported septicemias, some fatal, which have originated in tonsillar infections. In their cases in all probability, the infection is due to a direct passage of bacteria into the blood-stream.

Endocarditis, nephritis, pneumonia, pleurisy, meningitis, phlebitis, and eye lesions have all been reported many times as having an etiological relationship to tonsillar infection. Forchheimer[19] even reports appendicitis and five cases of an infectious jaundice resembling Weil's disease following tonsillitis. The infecting organism varied; streptococci, yellow and white staphylococci were present.

Rheumatic fever has long been associated in the clinical mind with tonsillar infections. With the work done to establish a definite bacterial etiology for rheumatism the tonsil has come in for its share of investigation. Fritz Meyer isolated from twenty-five cases of rheumatic tonsillitis a diplococcus which produced an arthritis in rabbits. Frissell[21] isolated from a rheumatic throat a coccus which regularly produced in animals a polyarthritis. The clinical association between the two conditions has long been noted by very many different authors.

The direct proof of cause and effect is lacking in a disease where a definite specific organism has not yet been isolated. The clinical connection, however, is so strong that we must consider the pharynx and tonsil as an ordinary portal of infection. Whether the disease is local and the absorption of toxins is responsible for the articular symptoms, or as Poynton and Payne believe, the organism circulates in the blood and lodges in the joints, one must assume either a special susceptibility of serous membranes for rheumatic toxin or a predilection on the part of the organism at fault for these same membranes.

Gurich,[22] in an interesting monograph claims to be able, particularly in chronic cases to differentiate articular disease of ton-

sillar origin from other forms, by tonsillar therapy which consists in surgically opening all existing crypts and emptying the pockets of pus. This is followed by an arthritic exacerbation which the author claims is proof of the interrelationship of the two conditions. The reaction occurs on the third or fourth day and is followed by remission or cure of symptoms. Treatment is continued until all crypts have been opened and kept open. His results follow, 140 cases of rheumatism of which twenty-three failed to react and were thrown out as not of tonsillar origin. Of the remaining, 102 cases followed which showed reaction, ninety-eight were completely cured. Many cases were of long standing.

There remain for discussion the exanthemata in which throat-symptoms form so important a part that it seems reasonable to postulate a throat infection. Of these, scarlet fever and measles stand out prominently. As we are ignorant of their etiology, further discussion of the mode of invasion is profitless.

Finally there are that group of cases which many believe to be secondary to long-standing sources of irritation in the mouth or pharynx. Thus gastritis, and pernicious anemia (Hunter) may be in some instances due to slight but constant absorption of pus-organisms from small local foci such as may exist around the roots of teeth or deep in the tonsillar crypts without evidence of local trouble unless unusual care is taken in the examination.

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VINCENT'S ANGINA. A STUDY OF THE INVASION OF THE TONSIL.*

BY WM. P. WHERRY, M. D., OMAHA.

The tonsils, occupying as they do, the most prominent position in the fauces, especially during any faucial activity, small wonder is it then that we have as many, and as varied a group of inflammatory reactions of these organs as is commonly found, also the depth of the crypts and the poor drainage from them tend to materially increase this susceptibility.

Among those infections of the tonsils which at times are rather puzzling is the so-called Vincent's angina.

I am quite aware that a contribution on this subject may seem of minor importance and even interest. However, having had an opportunity of studying at first hand more than fifty cases, my interest and enthusiasm was aroused and this was indeed stimulated by the utter absence of satisfactory information from the available literature. Practically all that I could glean has been relative to the genesis and characteristics of the germ, with reports of several cases which were the unusual rather than the usual manifestations of this disease.

Unfortunately, many of our earlier cases were not tabulated with sufficient detail from which statistics could be drawn. However, statistics are oftentimes unreliable. What one observer seems to prove, will be controverted by an array of figures equally as long and convincing, consequently I do not intend to tire you by quoting figures or cases, but will express as succinctly as possible our observations and allow you to accept them or not as you choose.

There are two distinct manifestations of this disease, the tonsillar invasion and the extra-tonsillar. Each, although having the same specific germ, has nevertheless a separate pathological entity. The extra-tonsillar invasion is much the less characteristic, in fact, the specific organism is abundantly found in noma and other forms of stomatitis, the ulceration here is superficial and its progress and associated symptoms are so different from the tonsillar type that we are forced to admit that Vincent's angina considered as a disease per se is essentially an invasion of the tonsil.

It will be my aim therefore in this dissertation to confine myself very largely to the tonsillar type. In all our cases, with one

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exception, the attack and the invasion have been so very similar, the one exception presenting the pathological evidence so classically described in our text-books that we are lead and forced to say that this exceptional case was due to a particularly virulent strain of the organism, and is not characteristic of the usual invasion found in practice. I do not wish to imply that our text-books are wrong, only they do not go far enough.

Vincent's angina, then, as referred to the tonsil, is essentially a necrotic ulceration, there being in all probability a considerable number of cases in which it is not sufficiently aggressive to compel recognition. This, however, does not at all lessen the ill effects of the complication nor the necessity of its proper diagnosis.

The necrosis first starts in a crypt, evidently a diseased crypt, for we have yet to see our first case wherein the crypt was not the initial site of the invasion.

We know that during faucial activity the tonsils are thrown forward. It is during this activity that drainage from each crypt is promulgated, yet in those crypts situated high up on the tonsil behind the anterior pillar, the mouths are compressed during these movements; consequently drainage from them is much poorer than from the rest. It is in this portion of the tonsil close to the apex and behind the anterior pillar that we usually find the affected crypt. In only one case of which we have a record has there been more than one crypt involved, and only in this one case were both tonsils involved.

There seems to be a difference of opinion among those who have written on the pathology of this disease, as to the method of progress of the advancing ulcer; some holding that the tendency is to progress deeper and not latterly, while others claim the converse. We do not intend to endeavor to prove either, our theory, however, being that of the former, namely that the necrosis extends latterally. We hold that the germ finds lodgment in the base of a crypt already prepared by poor drainage, the retained secretions and epithelial debris serve as an excellent flora for the germ, which thrives and as pressure increases the culture is not only augmented, but nutrition to the surrounding parts is lessened and the invasion progresses rapidly. As the invasion progresses, nutrition to the parts above is cut off and they slough off en mass, leaving a large, foul-smelling hole. I say hole, for that more aptly expresses the appearance. This hole seems to be just as broad at its mouth as at its base and very deep. It is upon this point that we sustain our assertion that the latterly progress starts at the base of the crypt. When the ulcer occupies the usual site of election,

namely the upper angle, oftentimes a cotton-wrapped probe can be passed to a great depth, meeting with scarcely any resistance. All this merely goes to prove the point in question.

The ulcer is filled with cell-detritis and necrotic tissue, the advancing necrosis assuming the appearance of a thick, dirty pseudo-membrane. Just as soon as the tissues slough away, leaving the crypt open, then the invasion is checked and soon stopped. It seems that as soon as pressure is released and drainage established, the germ loses its virulency. Under ordinary conditions, repair is now rapid. This circumstance is one of the several very interesting phases of this disease; for it seems the prepared ground and the altered nutrition is almost as essential for the furtherance of this disease as is the presence of the specific germ. All this satisfies me that the germ in its usual strain is far from being a very virulent one, especially so, as on the second and third day after the breaking down the fusiform bacillus is usually conspicuous by its absence.

At this time it seems rather opportune to describe in passing the appearance of the ulceration when involving the extra-tonsillar tissue. Here we have a superficial ulcer usually circular, involving only the mucous surface, having a most characteristic red, slightly raised areola, surrounding it, the margins being slightly undermined. If the tonsil is not involved, the symptoms present are only those of a simple ulcer.

The symptom-complex of the tonsillar type is in a way characteristically true. The symptoms are similar to those of lacuner tonsillitis. However, those wherein the difference lies are all rather marked: (1) There is absolute absence of any accelerated temperature; (2) the pain is more localized on the affected side, being quite severe and lancinating; (3) the general malaise and physical exhaustion is very profound. The absence of any rise in temperature is the most peculiar characteristic; for all other tonsillar invasions even those of less area involved and apparently of less virulence are associated with rapid rise in temperature. The absence of this symptom is one of the most constant signs, and is especially difficult to explain in the face of the great malaise and exhaustion which is usually of toxic origin. The localized pain simulates very much that of quinsy; in fact, oftentimes from the patient's appearance we have made a tentative diagnosis of peritonsillar phlegmon, this being dispelled on examination. The general malaise and exhaustion is very profound, much more so than in lacunar tonsillitis.

The cervical glands are rarely affected in the usual invasion of this disease. In the virulent infection, however, they are always

markedly swollen and very tender. The diagnosis cannot be made from the symptoms but can only be made by local examination plus finding the germ.

There are various stages to be considered in the study of this disease. The first stage is the onset. This seems to be very sudden, associated with beginning malaise, pain, etc. Upon examination, if the invasion is high up in the usual site of election, the tonsil will appear almost normal, but the anterior pillar will be unduly congested and apparently pushed forward, presenting very much the appearance of early quinsy. Upon retraction of the anterior pillar the offending crypt is observed greatly swollen, bulging and a purulent secretion exuding from its orifice.

For a patient seen in this stage, unless care is exercised, the diagnosis is liable to be that of early quinsy; for most of the tonsil presenting is nearly normal, the affection seeming to be in the peritonsillar tissue and I doubt not but that many of these cases have been so taken. I can recall many cases presenting these symptoms wherein we had incised and although we did not get the usual flow of pus, yet the patient was relieved. I believe if I had strongly retracted the anterior pillar I would have found Vincent's angina. The incision simply promoted good drainage and nature disposed of the infection in her usual way.

The second stage is the exemplification of the first, with all the symptoms accentuated. Now the ulcer has broken down, presenting the large necrotic hole, the border of which extends beyond the anterior pillar. This stage is from twenty-four to seventy-two hours after the initial onset. The diagnosis now is rather easy and can only be confused with lues and when the sudden onset, the rapid progress, associated with the profound toxic evidences are considered, even here the diagnosis is not especially difficult.

The third stage is that of repair. This is variable in time, some cases being entirely well in two to five days, while in others of less initial violence sometimes, but whose physical resistance is low the repair is oftentimes exceedingly slow.

It is at this time that many patients consult their physicians, not so much on account of the sore throat, but usually for the general run-down physical condition. Unless treatment is directed at the offending crypt, it is usually far from satisfactory.

The appearance of the ulcer has now changed and especially if the attack has been of one or two weeks' duration, the necrotic appearance is mostly gone, leaving in its place a deep, open-mouthed hole from which exudes pus and other cell-detritis, and although the specific germ is again usually conspicuous by its

absence, yet the specific treatment is more effective than our old method of deliberately cauterizing with the galvano-cautery.

The above describes what we are pleased to call the usual attack of Vincent's angina, wherein the tonsil is the site of election and wherein they alone are affected. I now want to recite rather in detail a classic case according to our text-books.

Mr. L. Mc. C., seen through the courtesy of Dr. Goetz, aged 22, civil engineer, luetic history. About two weeks ago he was taken rather suddenly with a sore throat, left side, pain, malaise, etc. These symptoms grew rapidly worse and in a few days the buccal mucous membrane of the cheek on the same side became very sore, as well as the cervical glands, also on the same side. A few days ago the opposite side became sore.

Examination: A deep necrotic ulcer on the left tonsil occupying the upper angle, a thick, pseudo-membrane over a greater part of the tonsil which could not readily be wiped away. On the buccal mucous membrane of the same side there was a large superficial ulcer, irregular, and probably one and a half inches long, of variable width, having indurated margins. The entire floor covered with foul-smelling cell-detritus. On the right tonsil a beginning ulcer in the usual site of election. Cervical glands left side greatly swollen and very tender. The patient was exhausted and rather despondent; no accelerated temperature. Smear loaded with the specific germ.

I have mentioned this case to illustrate the unusual manifestations and will say in passing, that the patient is making excellent progress under the appropriate treatment.

Practically all of our cases have come from those whose work is of a very dirty nature, most have been young males.

The treatment of this disease is very simple comparable to the extensive necrosis and involvement that is incident. The two cardinal points in the attack are promotion of drainage and stimulation of nature's efforts, together with cleanliness of the ulcer. No matter in what stage the disease is apparent, on the first visit we use a cotton-wrapped probe, doing as it were a gentle curettage of the crypt. This removes all detritus and establishes drainage; the application of silver nitrate 12 per cent is then made as a specific. We have found from extensive experimentation with weaker and stronger solutions that this strength is the proper one. We have, in addition, tried carbolic acid and other cauterants, but none seemed to be as effective as the 12 per cent silver. I believe that a logical explanation of why so many cases reported have not done

well is that the operator used either too mild or too energetic methods in his efforts at treatment.

I will say that since we have been using this method of treatment, all our cases have yielded excellently. Just whether this specific action is chemical or bactericidal, I am not prepared to say.

It may not be amiss at this point to give a brief resumé of what is known of the specific germ. The fusiform bacillus is a long, slender bacillus with pointed ends, the center portion being much the thicker. Occasionally the end may be somewhat rounded or the rod may be very thick. These bacilli are usually distributed uniformly throughout the smear, being oftentimes in pairs, end to end, or forming angles. These stain the best with carbol-fuchsin. Sometimes the stain is taken up unevenly by the organism presenting a peculiar banded appearance.

There is always found associated with the bacillus, numerous spirochetes. Just what the relationship is that exists we are unable to say; some authorities, namely Tunnecliff, hold that they are but different phases in the life of the same organism, others, that they are separate and distinct, the two acting in symbiosis, the spirillum serving to enhance the virulence of the bacillus. These authorities claim that those cases in which only the bacilli were found did not present the typical necrosis and where they both were found there always was necrosis. Be that as it may, in all our cases, both organisms were found. We have been unable to grow any cultures, although this has, I believe, been done, but under great difficulty.

In completing a dissertation of this character, one should analyze one's work and by this self-imposed criticism find the reason for the failures and the successes. This retrospect, as it were, expressed concisely, is the most valued asset of one's study. In this light to my own satisfaction I have induced the following facts:

1. That the bacillus fusiformis in its usual activity is not a very virulent organism, that the ground must be prepared by other organisms and by lowered resistance for its invasion. 2. That Vincent's angina is essentially a disease of the crypt of a tonsil induced by poor drainage plus the germ. 3. That the promotion of drainage and the application of 12 per cent silver nitrate is a specific cure. 4. That the usual site of election is the upper angle of the tonsil behind the anterior pillar.

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DIAGNOSIS OF ASSOCIATED DISEASES OF THE EYE AND NASAL ACCESSORY SINUSES.*

BY FRANK BRAWLEY, M. D., CHICAGO.

The close relation of nasal to ocular disease becomes more apparent as we learn to look for the important diagnostic points.

There are five types of accessory sinus disease affecting the ocular apparatus; acute or chronic sinusitis with external manifestations, as orbital cellulitis, abscess, tumor or edema of the eyelids: sinusitis without external signs but accompanied by optic neuritis, retinal disease, scotomata, visual field-defects or ocular muscle paralysis; sinuitis as a possible cause of glaucoma, iritis, keratitis, uveitis, etc.;—rarely mucoceles of the sinuses act as the etiologic factor—and lastly, unilateral pain or headache due to rarefaction of the air within the frontal sinus or ethmoidal cells.

SYMPTOMATOLOGY: Asthenopic symptoms due to sinus disease are usually reflex in nature but may also be due to a toxic process or to stasis in the orbital circulation resulting from the circulatory disturbances within the diseased sinuses.

These symptoms are identical with those due to refractive and muscular anomalies of the eyes and are therefore first seen by the oculist. Syndacker[1a] found that from seven to ten per cent of the patients who consult the oculist on account of headaches are really suffering from disease of these sinuses.

The location of pain and headache due to sinus disease is not constant for each sinus, although in a general way the walls of the affected sinus are usually painful to pressure and stooping frequently serves to localize the pain by causing a sensation of pressure with increase of the pain within the affected cells. Sinus pain is frequently paroxysmal, beginning and ending at about the same hour each day. A confusing fact is the inability to use the eyes comfortably during the attacks of pain, leading the patient and his oculist to believe that their origin must be ocular. In such cases, however, there are always intervals during which the patient experiences no discomfort no matter how much he uses his eyes, and again the pain of a sinus disease may occur at night, unlike the pain of eye-strain, which is practically always relieved by rest.

*Read before the Meeting of the Chicago Ophthalmological Society, April, 1911.

VISUAL FIELDS: All varieties of visual field anomalies have been ascribed to sinus disease, but the most valuable findings are central and paracentral scotomata and enlargement of the blind spot. There is no space here to deal with the literature of these investigations. Suffice it to say that the work has been advanced by such men as Ziem, Birch-Hirchfeld, de Schweinitz, Van der Hoeve, de Kleyn, and Ramsey and Sutherland and a great many others.

Where a central scotoma is present it is usually unilateral and may be found only for colors, disappearing when the affected sinus is drained, or remaining to some degree where permanent damage to the central fibers of the optic nerve has occurred.

MacWhinnie[1] has described a horseshoe-shaped paracentral scotoma in disease of the posterior cells which gradually disappeared by segments following the establishment of drainage of these cells, returning when the drainage was interfered with.

Risley[2] has reported a return to normal vision and visual fields from proper drainage of the frontal and ethmoidal cells after two years of optic neuritis with flame-shaped hemorrhages throughout the fundus, impaired central vision and contracted fields.

One of the writer's cases with a well-defined papillitis and edema in the macular region due to a combined frontal, ethmoidal and antral infection, showed an absolute central scotoma for red and contraction of the fields for white and red chiefly temporally. Two months after operation to establish drainage the field for white had extended 20° temporally, and only a slight relative central scotoma for red remained, the vision having improved from 20-100 and J. 10 to 20-30, and six months later the vision remained 20-30 and plus 1.50 S. gave J. 1. The papilla still showed some evidence of the exudates but the edema had disappeared.

De Schweinitz[3] has also described a ring-scotoma in the left eye and a triangular paracentral scotoma in the right eye in a case showing pus in the left sphenoidal sinus. This case slowly improved following irrigation of the sinus. An unusual feature of this case was a fugitive episcleral congestion accompanied by a curious wrinkling of the corneal epithelium.

That the visual field is not always affected is shown by Haeffner and Henrici,[4] who found no disturbance of the fields in seventeen cases of ethmoidal and three sphenoidal sinus infections. In contrast to the scotoma of general toxemias, such as toxic amblyopia, chemical poisoning, etc., the scotoma due to sinus disease is usually unilateral.

The eyelids may show edema as a result of frontal or anterior ethmoidal infection, and this tends to lessen as drainage is established, being less at night than in the morning. Where orbital involvement occurs, the lids become swollen, red and indurated with edema of the conjunctiva. Edema of the upper eyelid is considered by Gerber to be one of the earliest symptoms of orbital involvement. Epiphora practically always accompanies a sinuitis which affects the eyes and is frequently the earliest symptom. In addition, we are all familiar with the rôle played by sinus disease in the causation of the commoner diseases of the lacrimal apparatus.

The cornea and sclera are rarely affected in sinus disease, although Posey[5] and Gerber[5a] mention the occurrence of a herpetic eruption on the cornea and de Schweinitz has observed a wrinkling of the corneal epithelium in a few cases of episcleritis due to sinus disease.

Sinus disease should be excluded in all cases of paresis, paralysis or insufficiency of the ocular muscles.

The external rectus is most frequently affected in the former conditions because of the close relation of the sixth nerve to the wall of the sphenoid sinus. The internal recti are very frequently affected due to their close apposition to the orbital plate of the ethmoid labyrinth. Excursion of the eyeball toward the affected muscle is usually painful.

Holmes[6] has observed complete paralysis of the extra-ocular muscles with ptosis recover almost completely within a few weeks following drainage of the frontal sinus, antrum and anterior ethmoidal cells.

Ziem[7] has produced strabismus experimentally by closure of one nostril resulting in asymmetrical development of the orbit and ethmoidal cells.

Now that we are seriously considering the nose as a factor in ocular disease, we are finding these associated conditions more often. This is nowhere better exemplified than in the various intraocular diseases. The writer recently saw a case of severe iritis, where all indications seemed to point to an intestinal auto-intoxication as the cause. Proper diet and eliminative treatment for several days made no impression upon the iritis and where at first a cursory nasal examination had revealed no sinus disease, at a later observation following the use of the suction apparatus, pus was found draining from the anterior ethmoidal cells. The iritis entirely disappeared within thirty-six hours following the successful drainage by means of the suction pump.

Eversbusch[8] has observed turgescence of the turbinate bodies on the side of the injured eye where sympathetic ophthalmia occurred and this nasal congestion disappeared after enucleation of the first eye. Eversbusch therefore considers this an important indication to enucleate.

Nasal operations have apparently caused intra-ocular hemorrhage, as in the case described by Holmes, where a circumscribed choroidal hemorrhage occurred twenty-four hours after removing a polypus with cauterization of the base. Thigpen[9] also observed a severe intra-ocular hemorrhage following the drainage of a sphenoidal sinus which required enucleation for a secondary glaucoma.

Axenfeld[10] has noted the frequent occurrence of chills at the onset of retrobulbar neuritis, and considers this symptom to indicate the accessory sinus as the probable cause.

Widmark[11] reports a case of bilateral retinal detachment which was, in his opinion, cured by treatment of polypoid degeneration of the lining-membrane of the ethmoidal cells and a maxillary sinusitis with orbital inflammation. The retina of one eye reattached in twelve days with vision of 9/10 while the other eye recovered in one month, vision not given.

Posey[12] has reported a special type of retro-bulbar inflammation caused by acute posterior sinusitis due to sea-bathing. His cases exhibited hazy vision, diminished light-sense, central scotomata, and usually pain on pressing the globe backward into the orbit. Posey believes that edema of the optic nerve occurs in these cases, and has in some instances noted blurring of the papilla and partially dilated pupil.

Orbit. In view of our present belief, as expressed by Birch-Hirschfeld, that practically all orbital inflammations are due to disease of the accessory sinuses, it seems remarkable that even as late as 1882, Schwendt published a dissertation on orbital disease in which these sinuses received no mention whatever. The picture of orbital inflammation, with the red, brawny, swollen eyelids and displaced globe is familiar to all. Some idea of the source of the infection may be gained by noting the direction of the displacement of the eyeball, down and out in frontal sinus infection, outward or up and out in ethmoidal, and in sphenoidal disease the globe is proptosed almost directly forward.

Van der Hoeve[13] has found enlargement of the blind spot, which he calls peri-papillary scotoma, to be one of the earliest symptoms in disease of the posterior accessory sinuses. His own investigations and those of de Kleyn revealed this symptom in fifty-four of

fifty-nine cases of disease of the posterior cells, and only once in disease of other regions of the nose. He considers that this symptom is positive when the color-scotomas are larger than that for white, or the extent of the blind spot for white and colors is greater than normal or the size of the scotoma changes during the course of the nasal disease.

An interesting experiment by de Kleyn[14] showed that when the ostia of the accessory sinuses were blocked by a tampon the peripapillary scotoma was produced only in the sinuses having diseased lining-membrane, so that toxins apparently play the chief rôle. This type of the enlargement of the blind spot of Mariotte is to be distinguished from the scotoma of the toxic amblyopias, which frequently include the region of the blind spot, and especially from that peculiar vertical spindle-shaped enlargement noted by Maitland Ramsey and Sutherland[15] in sympathetic ophthalmitis. Accurate mapping of the blind spot is not possible, however, without the use of a Bjerrum screen.

If at the first appearance of the lid-edema the sinuses are investigated and proper drainage established, it would rarely be necessary to do the radical operations about the orbit and the safety of the globe would be assured. The writer has had the experience of operating by the orbital route and finding no pus in the orbit, but diseased posterior ethmoidal cells. Since that time several cases have been apparently permanently cured by intra-nasal operation alone and in one case by evacuation of infected ethmoidal cells by means of the suction pump. This latter case, however, was treated only about six weeks ago, too soon to draw conclusions. The presence of streptoccoci or pneumoccoci in the sinus-pus in the orbital inflammations indicates the necessity for early operative intervention, as these cases present the most violent reactions and are likely to extend rapidly and result fatally.

A fatal case of streptococcus infection occurred in the writer's practice. The patient, aged 76 years, had suffered from severe headache for six weeks and was constantly under opiates. There was a unilateral optic neuritis, which had resulted in complete blindness when first seen. Skiagraphs were negative for all sinuses except the sphenoid, and I was assured that this sinus could not be well shown in a skiagraph. Examination by means of the suction pump upon four occasions showed muco-pus draining from the corresponding choana. The anterior sphenoidal wall was accordingly removed and the lining membrane found to be discolored and much thickened. Examination a few hours after operation re-

vealed necrotic bone at the super-external angle of the sinus and thick pus was draining from the wound. The headache was at once relieved, and no further opiates were required. In spite of drainage, however, the process gradually continued and resulted fatally from meningitis fourteen days after operation. Cultures from the sinus and the blood showed streptococci.

As improvements in diagnostic methods, such as the X-ray and the vacuum apparatus, make early diagnosis of sinus disease possible, we are more frequently detecting its influence upon the ocular structures. We are also finding that the ethmoidal cells are much more frequently diseased than we formerly believed and that they act much more frequently as the source of the ocular disease than the frontal or maxillary sinuses which, doubtless owe their past prominence in this respect to their greater accessibility. It is sometimes difficult to differentiate between orbital disease of sinus origin and that due to new growths, but nasal findings, skiagraphs, temperature and differential blood-count should decide the question.

In closing, I wish to make a plea for the routine examination of the nose in all cases of ocular disease, and also for the exercise of conservatism and careful judgment to avoid needless operative work upon so important a functionating organ as the nose. Too great enthusiasm in this direction cannot fail to reflect discredit upon this work, and to some extent retard its progress.

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Chicago Savings Bank Building.

REMOVAL OF LARYNGEAL POLYPUS UNDER GUIDANCE OF THE PHARYNGOSCOPE.*

BY OTTO GLOGAU, M. D., NEW YORK.

On December 6, 1910, Morris K., was referred to me by Dr. James Goldlust, with the following history: He was suffering from hoarseness since childhood and was treated for laryngeal catarrh without getting relief. His case was diagnosed recently as papilloma of the vocal cords. Owing to his nervousness he could never keep quiet long enough to allow the introduction of an instrument into his larynx, even after thorough cocainization.

Present history: Patient is 25 years of age, very much emaciated and extremely nervous. His voice is husky and it appears to strain him greatly to make himself understood. Local inspection reveals the pharynx and larynx to be in a state of chronic catarrhal inflammation. On each vocal cord there is a polypus the size of a pea, situated about five millimeters from the anterior commissure. When vocalizing, the two polypi are brought into contact and prevent the rima glottidis from closing.

To allow the introduction of the laryngeal mirror, the patient had to be cocainized very thoroughly and even then he became extremely nervous when the mirror touched the soft palate and would gag. At the third sitting, the parts had been pretty well saturated with a thirty per cent solution of cocain, but whenever the laryngeal mirror was brought into contact with the soft palate, he gagged and would relax the hold of his tongue; thus preventing me from introducing any instruments into the larynx proper.

The patient would not submit to direct laryngoscopy. It occurred to me to try the pharyngoscope. As no operation whatsoever had been performed under the guidance of the pharyngoscope, I had to work out my own method.

I had the patient pull out his tongue as far as possible and introduced the pharyngoscope, being especially careful not to touch the soft palate. The patient stood this procedure exceedingly well. The picture of the larynx seen by means of the pharyngoscope was very striking, the two polypi appearing, as it were, just in front of my eye. Passing the laryngeal cutting-forceps alongside of the il-

*Read before the Meeting of the New York Academy of Medicine, March 23, 1911.

luminated pharyngoscope over the epiglottis I was able to locate the point of the instrument in the aditus laryngis, by looking through the pharyngoscope. I could then easily follow every movement of the instrument and was greatly pleased to get close to the polypi by working my way downwards and not be disturbed by the inverted picture in the laryngeal mirror. I had the tube bent laterally at its end, so as not to obstruct the view of the cutting part of the instrument. Through the holes of the vertically working forceps the polypus could be seen while in the grasp of the instrument. The patient was breathing easily, while the lower branch of the forceps elevated the polypus from beneath the vocal cord where it had dropped by its weight. The closure of the two branches cut the polypus clear off at its root. With the same ease the other polypus was removed, without the patient showing any concern whatsoever.

To sum up: 1. There are cases of extreme nervousness, where the mere touch of the laryngeal mirror prevents any operative interference on the larynx, even after thorough cocainization. 2. Intra-laryngeal operation under guidance of the pharyngoscope is of great value, as it combines the advantages of the direct laryngoscopic picture with comfort to the patient. 3. While this method is not destined to replace all others now in vogue, it will be valuable in selected cases like the above-mentioned one. 4. In intra-laryngeal manipulations like probing, etc., the above-method will, on account of its advantages, find a place in the technic.

Pharyngeal Parethesia as a Symptom of Tumors of the Digestive Tract. A. PUGNAT. *Rev. hebd. de Laryngol., d'Otol. et de Rhinol.*, Jan. 7, 1911

In a case of carcinoma of the intestine, stomach and rectum a feeling of a foreign body and similar manifestations appeared in the pharynx before the symptoms of the former trouble became apparent. The author supposes a connection between the symptoms.

ED.

A TUBE FOR CLOSING AND REMOVING AN OPEN SAFETY-PIN.

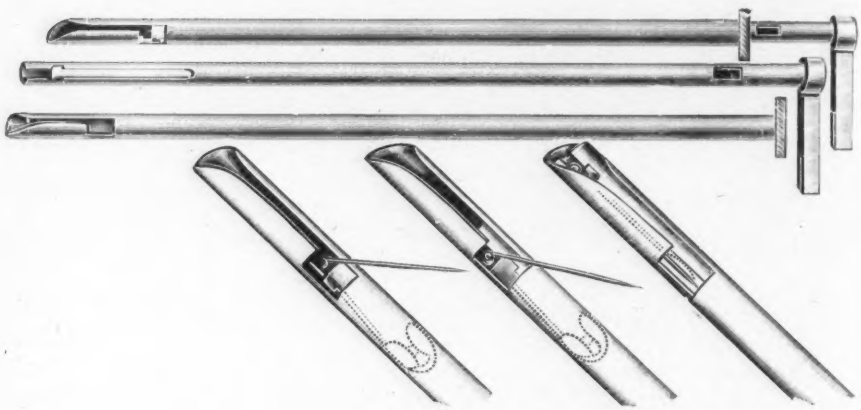
BY HARRIS PEYTON MOSHER, M. D., BOSTON.

Last year when Dr. Jackson reported his method of carrying an open safety-pin into the stomach, turning the pin and then closing it by bringing it back into the esophagoscope, it seemed as though the last word had been said on this subject. A few months ago in the case of a child, 2 years old, I failed to get a huge safety-pin by this procedure. The pin was lodged back of the arch of the aorta. The point was up and to the right, and about it there was a rent in the esophagus an inch long. In the manipulations everything that could go wrong promptly did so. The pin was finally pushed into the stomach and removed by cutting. The result caused good-natured remarks to be made at my expense by some of the members of the general staff. The boy died twenty-four hours after the pin was taken out. The findings before death indicated pneumonia. My failure in this case crystallized an idea for a safety-pin closing-tube which had been running in my head for some time. As yet the tube has not been tried on the living. Experimentally, however, it works well; that is, it will close and remove an open safety-pin, point up, from various sizes of rubber tubing. Not only this, but it will remove the familiar glass-headed pin and the ordinary brass one. The tube can be used not only in the esophagus but also in the trachea and in the bronchi. Therefore, another word, such as it is, appears to have been added to the discussion of the methods of removing safety-pins.

The safety-pin tube is essentially a double esophagoscope. It consists of an outer tube which catches the pin and an inner tube which locks the pin in the outer tube, houses the point and closes and extracts the pin. The tube will do the same by a straight pin except that the withdrawal of the inner tube does not bring the pin with it. In order to get the straight pin out, both tubes have to be removed together.

The safety-pin tube can be lighted either by the method of Jackson or by that of Bruening. In the tube illustrated in the cuts the light is obtained by Bruening's lamp. The detailed description of the tube is as follows: The safety-pin tube is a tube within a tube. The lower end of the outer tube is cut away on a long slant, and

on the side there is a slit which runs up some two inches. The beginning or the mouth of the slit is made in the form of a wide V. At the upper limit of the slit there is a quadrilateral opening which offsets the slit. The inner tube, like the outer one, has a slit on the side which also runs upward two inches. The slit in the second tube begins square and is so made that it allows a T-shaped tongue to fit in it and play it. The upper end of the tongue is fixed to the shaft of the inner tube while the rest of the tongue is movable. In order to adjust the tubes for use, the inner tube is placed in the outer one and carried down so that the slits in the two correspond and so that the lower end of the inner tube comes to lie slightly below the quadrilateral opening in the outer tube. When the tubes



are thus placed the lower end or the head of the tongue of the inner tube does not quite close the quadrilateral opening of the outer tube, but leaves a sufficient space for the shaft of the safety-pin. When one tube lies in the other in this manner, if the outer tube, the slit of the tubes being, for example, on the right, is rotated on the inner tube and rotated to the right, the riding by of the two tubes causes the quadrilateral opening in the outer tube to become closed. Up to this point the outer tube corresponds to an open ring, now it has been turned into a closed ring.

The working of the tube can be made clearer by leaving the description of the empty tube and describing from now on the tube with the safety-pin in it. When a safety-pin is caught in the

esophagus, open and point up, the point of the pin is embedded in the tissues and it is hard to find. The other half of the pin, the part which bears the cap which receives and holds the point when the pin is closed, lies free in the esophagus and is comparatively easy to discover and to grasp. Imagine a case, if you please, in which the X-ray plate shows that the point of the pin lies on the patient's right. The two parts of the safety-pin tube are adjusted after the manner which has just been described, and are locked together by a ratchet placed for that purpose near the beginning of the outer tube. The tube is introduced into the esophagus with the slit on the right and is carried down until the cap of the free half of the pin is discovered. Then the cap is grasped with locking alligator forceps and steadied while the tube is pushed further down. As the tube advances the half attached to the cap comes into the tube while the other half which bears the point is embraced by the slit. Finally, the bend of the pin where the spring is brings up at the top of the slit. The safety-pin is now to be locked in the main tube. This accomplished by loosening the ratchet which holds the two tubes together and by rotating the outer tube to the right over the inner tube until the outer tube brings up against the shaft of the right half of the pin. When the outer tube has been rotated to the right as far as it will go it is held strongly in this position and both tubes are pushed down a little in order to free the point of the pin from the tissues. This done, the outer tube is held motionless while the inner one is rotated a quarter of an inch to the left. This houses the point of the pin in the lumen of the outer tube. The final manipulation is to push the inner tube down as far as it will go and then withdraw it. As it comes out it brings the safety-pin. This description sounds a bit complicated, but in reality the manipulations are simple, and become, when they have been practiced a few times, almost automatic.

In dealing with a pin with a glass head, or with an ordinary brass pin lying aslant across the esophagus and with the point up and embedded, the tube is introduced with the slit turned to the side where the point of the pin lies. The slit of the tube is made to engage or straddle the shaft of the pin and is carried down until the upper part of the shaft of the pin rests against the top of the slit. As in the case of the safety-pin the outer tube is now rotated strongly to the right, again supposing the point of the pin is on the right, until the rotation is stopped by the shaft of the pin. With the pin held firmly by the two tubes both are pushed downward a little in order to unlock the point of the pin from the

tissues. The next procedure, as before, is to rotate the inner tube to the left and push it home. Up to this point the manipulations are the same as those used in dealing with a safety-pin. When, however, the straight pin is housed in the outer tube, the withdrawal of the inner tube does not bring the straight pin with it as it does when dealing with a safety-pin. In order, therefore, to bring out the straight pin both tubes must be removed together.

The tube can be made to grasp a straight pin when it lies in another common position, that is, aslant, across the esophagus and head up. In such a case the point lies below and is embedded, whereas the head is uppermost and free. The tube is introduced in the usual manner and the slit is made to embrace the head of the pin and a bit of the shaft. The tube is carried downward until the head of the pin lies at the top of the slit. Then the outer tube is rotated on the inner one until the shaft of the pin stops its further movement. The head of the pin is now locked in the outer tube. Both tubes are removed together. As the pin comes out, the head lies in the tube and the shaft outside and roughly parallel with the tube. This maneuver is given because, theoretically at least, the tube can be called a "complete" pin-catcher. In practice, however, it is doubtful if this last manipulation would ever be carried out. With the head of the pin once inside the tube the obvious and instinctive procedure is to grasp the head or shaft of the pin with the forceps and to pull the pin out.

It is a little odd that the form of the metal cap of the ordinary safety-pin and the form of the lower end of the outer tube of the pin-catcher should happen to be so much alike. The principle of the two is the same. Two or three appropriate but overworked comparisons such as "set a thief to catch a thief" at once assert themselves. The reader is spared all but this one, and in return for the favor he is expected not to make this comparison apply to more than the tube.

828 Beacon Street.

Tack Lodged in Left Bronchus. G. TAPIA. *Rev. espan. de Laringol., etc.*, Jan., 1911.

The tack was removed by lower bronchoscopy fourteen days after being swallowed by a girl of 4 years. ED.

NEW INSTRUMENTS FOR SUB-MUCOUS RESECTION OF THE NASAL SEPTUM.

BY DR. C. J. KOENIG, PARIS.

The difficulties met with in the course of a sub-mucous resection of a deviated nasal septum, have led me to the construction of a few instruments destined to serve as adjuncts to or to take the place of others. They consist of:

Figure 1.

1. A bent, step forceps (figure 1), with a double horseshoe-shaped tip, destined either, in the operation of Freer, to hold down by its own weight the anterior flap which often interferes with the incision and removal of the cartilage, or in the operation of Killian (incision far forward) to suture the wound with the needle described below, (figure 4).

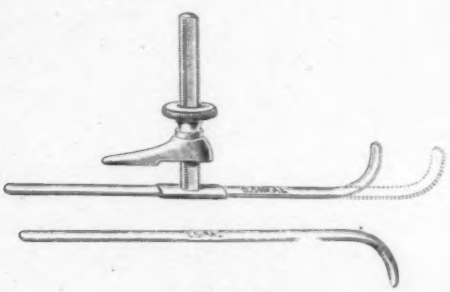


Figure 2.

2. A speculum flap-retractor with a movable and flexible flat shaft (figure 2), which can be fixed on the lobule of the nose by means of a cursor and a screw. The first step of the operation terminated, this speculum, held by an assistant placed behind the patient, can advantageously take the place of the Palmer speculum or may even be placed simultaneously with the latter. The ordinary retractors held by an assistant have a tendency to tear the flap or to perforate it posteriorly if the patient make a movement

of the head. This speculum holds the flap exactly in the position the operator desires and does not constantly change place with an involuntary or untimely movement of the assistant or the patient.

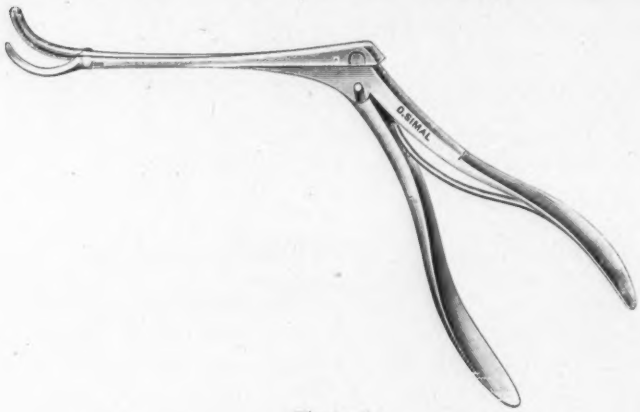


Figure 3.

3. A Gruenwald-Struycken forceps modified in its curvature, cutting like scissors and allowing an incision of the cartilage and bone (if the latter be not too thick), circumscribing the deviation (figure 3). It can be turned up and down, cuts always in spite of repeated boilings. If the vomer or the perpendicular plate of the ethmoid is deviated and is too thick, one can have recourse to the Jansen forceps, or to any other strong bone forceps.

Figure 4.

4. A tubulated or cylindrical needle mounted on a handle, (figure 4). With this needle, silk-worm gut sutures (crin de Florence) are easily placed in the nose, the finest caliber being sufficiently rigid to pass through the needle. After the latter has been passed through the two lips of the incision, the suture is introduced into the needle, its internal end is seized by a forceps and the needle is removed.

65 rue de Miromesnil.

SPECIAL EDITORIAL DEPARTMENT

RADIOGRAPHY IN OTO-LARYNGOLOGY.

EDITED BY

JOSEPH C. BECK, M. D.,

CHICAGO.

The constant advancement in the radiographic study of pathological processes in every department of medical specialties has not been absent in that of oto-laryngology. While it is not an absolutely indispensable means of diagnosis, it is one to be depended upon for positive demonstration of changes in the nasal accessory sinuses and mastoid process.

The several objections raised in the various discussions and personal communications have been that: 1. The great difficulty experienced in the interpretation of the radiogram by the average oto-laryngologist, and the too frequent faulty interpretations by the radiologist upon whom most of the clinicians depend for this interpretation. 2. That the method is expensive and therefore not practical.

To answer the first objection: One must make frequent studies of a number of plates in regard to the various degrees of shadows and anatomical outlines, and constantly keep in mind and associate the other clinical findings, trying to make them fit each individual case. This will at once show why the radiologist, who, as a rule, is not well versed in oto-laryngological diagnosis, cannot make a proper diagnosis. Many of the radiologists are or have been general practitioners and will have no difficulty in interpreting radiograms of fractures, dislocations, kidney-stones, tumors, diseased bones, fistulae, etc., but they do have difficulty in interpreting nasal accessory sinus disease and mastoid affections. It would be well

to have one or more radiologists in each city who have been or are oto-laryngologists so that this difficulty could be overcome.

As to the second objection of impracticability owing to the expense, it scarcely can be applied to a scientific discovery. After all the great expense is only because the charges are too large. The actual expense of making two radiograms is very little.

The stereo-radiogram is beginning to be recognized as a marked improvement over the single picture, since it brings out the objects and details in their proper relations. Their value is especially great in chest diseases, foreign bodies and fractures. The value of stereo-radiograms in the diagnosis of sinus and mastoid disease, nowever, has not yet been demonstrated to be of such marked advantage over the single picture owing to the fact that the cavities which are photographed are, as a rule, shallow and have dense structures back of them, as the intra-cranial contents and solid bones of the cranium. The constant improvement in the technic of radiography together with much better instruments will, it is hoped, enable one to obtain stereo-radiograms of the sinuses and mastoid which will be far superior to the single picture.

A word as to the ill-effects from the application of this method of diagnosis will not be amiss. The reference is made to the possibility of loss of hair, burns and malignant disease. When a patient is exposed too many times within a week, particularly light-haired people, there may occur an alopecia of the area exposed and possibly some erythema. These conditions, however, are very rare, the writer having had only one case of loss of hair. There is no trouble about this except for the time being because the hair comes back stronger than before. As to burns or malignancy, it is not to be mentioned as a precaution as there are no authenticated cases known to the writer from just exposing a patient even several times for diagnostic purposes.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, February 24, 1911.

LEE M. HURD, CHAIRMAN.

Tracheal Stenosis with Bronchoscopic Dilatation. By EMIL MAYER, M. D.

This young woman has been under observation for a little over two years. When she was first sent to the surgical ward of Mount Sinai Hospital with a diagnosis of stenosis of the larynx, requiring tracheotomy, at Dr. Howard Lilienthal's request, I made an examination and concluded from the clinical picture that she had rhinoscleroma and on removing a small portion of the growth from the nose it was promptly reported to be a scleroma. With our knowledge of the history of previous cases, and in view of the fact that so many of these cases go from bad to worse, I made every effort to prevent a tracheotomy from being performed, which would necessitate her wearing a cannula for the rest of her life. She was accordingly placed in my clinic and for a year and a half, or a little longer, she has been having regular dilatation with the bronchoscopic tube. She has become accustomed to this procedure and permits the tube to be passed very readily in about thirty seconds' time. Her breathing is better than before she entered the hospital, and she goes about her work, and has no discomfort whatever. This procedure is of more interest than perhaps most laryngologists are aware of, especially those who have not seen many cases of tracheal scleroma. In the European clinics, especially those with Russian and Polish constituencies, there are many cases of tracheal scleroma. In one of the clinics there I saw six or eight men and boys, and one young girl, all wearing a tracheotomy tube. What their subsequent course was I do not know, but their future held little hope. If by this method of dilatation the otherwise inevitable stenosis may be held off, a great deal will be accomplished.

Syphilitic Necrosis of the Bones of the Face, Following Traumatism. By JOHN E. MACKENTY, M. D.

The patient, H. H., aged 28, was referred to Dr. Chappell's Clinic from the Eye Clinic about six weeks ago. He had been operated

upon in the Eye Clinic, but the wound had failed to heal. He gave a history of having had specific disease four years ago, and of having received an injury to the nose by being thrown from a horse. At that time the nasal bones were broken, and they failed to heal. In a man of apparently fine physical condition, this was quite suggestive, so the blood was examined; for the Wassermann reaction proved positive. He was accordingly given salvarsan intravenously five weeks ago, and the immediate result was an attempt on the part of nature to heal the external wound. The problem in his case was how to save the lacrimal duct; so three weeks later he was anesthetized, and the following operation was performed: A probe was passed into the lacrimal duct, and left in situ during the operation. Then an incision was made over the eyebrow, very much like the Killian incision, carrying it well down on the face. The whole inner wall of the antrum, lacrimal bone and ethmoidal cells were involved in the necrosis. The bone was removed from around the lacrimal duct, the antrum was opened, and part of the inferior wall of the orbit was removed. The ethmoid cells were removed and the frontal sinus was opened for exploration, but nothing was found in it. At the close of the operation the lacrimal duct hung free into the nasal cavity like a cord, without attachment below, yet since the fourth or fifth day following the operation the duct has been functionating. There is now no evidence of dead bone, and very little nasal discharge. The external wound has healed. The patient is under specific treatment, consisting of bichloride of mercury and potassium iodide three times a day. The interesting features of this case are the specific disease dormant until brought into evidence by an injury, the extensive necrosis surrounding the lacrimal duct and the saving of the duct by having a probe in it for a guide during the operation.

Modified Sub-mucous Operation on Children. By JOHN E. MACKENTY, M. D.

These two boys have been operated upon within the last ten days for obstruction of the nose, due to a deviation of the cartilaginous and bony septum. Dr. MacKenty said that five years ago he began experimental septal work on children,—removing some of the septum and breaking the rest of it into place. He found, however, that the breaking operation did not give permanent results, and that the septum warped back into its old position; so he devised the following modification of the submucous operation for children.

In children the deviations are frequently far forward and it is difficult to remove them without endangering the contour and development of the nose. The first boy had a deviated septum which came out and was adherent to the external nasal wall; the other case was similar, but the deviation was less pronounced. The operation may be described as follows:

A perpendicular incision is made forward of the deformity on the convex side, extending out on the nasal floor to the external wall. The mucus membrane is elevated from the convexity of the deformity. With a curette the septum is removed the whole length of the deformity along the floor and upwards for about one-fourth to one-third of an inch. Care is taken in doing this not to disturb the mucus membrane attachment on the concave side of the deformity. On the concave side the mucous membrane is elevated from the nasal floor out to the external wall. A knife of special design is introduced into the nose on the convex side and incises the cartilage behind and above the deformity through the mucous membrane and cartilage to the mucous membrane of the concave side *but not through it*. The incision begins on the floor and is carried upwards, curving forward till it reaches the under surface of the nasal bones. Then it is carried forward above the deformity to the tip of the nose. If properly done, the area of deformity now swings to the center and downward, partially filling in the space from which the cartilage has been removed at the base of the septum. If the deformed area occupies more than one plane of direction, incisions are made along the junctions of these planes and the segments then lined up so as to occupy one plane in the center. The primary incision is stiched and a temporary moulded splint is inserted on the convex side. The splint is worn for a few days. In about 100 cases operated, ether or chloroform was the anesthesia. In the last case, cocain, for the elevation of the mucous membrane and ether for the rest of the operation was used, making the operation technically much less difficult.

Ether is mostly used as the anesthetic in these cases, but acting upon the suggestion of a colleague, ether and cocain combined was used in the last case. One-fourth of one per cent cocain was injected, and the mucous membrane was lifted up, which is difficult to do under ether on account of hemorrhage. Then ether was administered, and the bone or cartilage work was done. The other cases were done under ether anesthesia. The hemorrhage makes the operation a prolonged and difficult one; if cocain can be used for the first stage, the operation can be made much easier.

DISCUSSION.

DR. CHAPPELL said that since Dr. MacKenty had performed the operation over a hundred times, it could not be said to be a new one, so far as he was concerned, but that it represents a new departure in nasal surgery for children. Of course, it is not intended for operation on spurs, but only for cases of great deformity. In the large number of such cases which he himself has treated, he has never been satisfied with any operation where the deformity was so marked as in the cases presented. In the cases operated upon by Dr. MacKenty by this method, the result was absolutely perfect. Dr. Chappell said that he hoped the members of the section would take up the operation and find out what a great boon it is for such conditions. The submucous operation in adults is well established, and this modification makes it a perfect operation for children. He has seen a number of children a few months after operation where the septum was apparently perfectly normal, and you would not know there had been any deformity in the nose.

DR. MAYER congratulated Dr. MacKenty on the excellent results he had obtained, and asked him to state more explicitly how he removed the portion of the maxillary ridge and bony portion of the septum, which formed the first and most important part of the operation. He had been much pleased to see this work, for in years gone by he himself had been much interested in septum operations. Only recently he had performed an Asch operation upon a young man with a great deal of deformity, and marked depression of the nasal bones, and obtained a splendid result. This case did not come under the class referred to by Dr. MacKenty, but he mentioned it to show that we cannot depend entirely upon one operation. Submucous resection has its limits, and does not relieve deformity of the bone and cartilage. There is a great field for Dr. MacKenty's operation, so far as children are concerned.

DR. COCKS said that he had seen the second of the two septal cases before operation. There was a marked anterior bowing of the cartilaginous septum, completely obstructing the left nostril. The septum was adherent to the left inferior turbinate at one point. If this patient had been operated by one of the breaking methods, such as the Asch, the septum would have been too long to replace in the median line and held there. For this reason he thought that Dr. MacKenty's operation was undoubtedly the one to be done.

DR. W. W. CARTER said that he had not arrived in time to hear Dr. MacKenty's presentation, but that he was much interested in

the subject, for the question of the removal of the septum in young children involves matters of greatest importance. He himself had operated upon several children, the youngest being 10 years of age. He has always advised the removal of only that portion of the septum that is involved in the deflection, and this applies to adults as well as children. For this reason he prefers the punch-forceps and the sharp curette originally devised by himself, for with these the amount of tissue removed can be accurately gauged.* Only three weeks ago Dr. Carter had an opportunity to see a child whom he had operated upon five years ago, the result was still perfect and the nose had gone on to its proper development. In this case he had removed only the portion of the septum that was deflected, the lower part chiefly, along the septal ridge. In a paper† that he read before the section five years ago, he first stated that the septum was developed in membrane from osteogenetic and chondrogenetic centers situated in the septum itself, and not from the periosteum, and that therefore the septum could not be regenerated when once it had been removed. Experience has shown this view to be correct, for recently he has seen cases he operated upon eight and nine years ago and the septa are as flaccid as they were the day after the operation.

Dr. Carter said that in view of these facts it is always necessary when operating upon children, to leave as much of the septal cartilage and bone as possible on account of the important part which it plays in the development of the flattened nose of the infant into the more symmetrical organ of the adult.

DR. ABRAHAM asked what was the age of the youngest child.

DR. MACKENTY replied that he had operated on children 6 years old and older and had employed general anesthesia in all cases except one.

DR. ABRAHAM asked what was the method of making the incision posterior to the deflection.

DR. MACKENTY said that he used an instrument like Dr. Abraham's separator, only very short on the end.

DR. ABRAHAM said that he had operated on many children, and invariably resorted to cocain and adrenalin. The children did not suffer much pain, and the operation was practically painless. The youngest child upon whom he had operated was 10 years of age.

DR. MACKENTY said that the child's nose should be corrected as soon as the condition is discovered. That was what had led him

*The Laryngoscope, March, 1906. †The Laryngoscope, June, 1906.

to do this work on the septum,—knowing the result in the contour of the face occasioned by waiting. If you wait until the child's face is developed, the facial deformity resulting can never be corrected. They should be operated upon by some method as soon as discovered. The child is entitled to nasal breathing, and it is a mistake to wait until adolescence to do these nasal operations.

As to the method of removing the cartilage at the base, he uses a sharp curette having an oval bowl. It will engage the cartilage and cut it without endangering the mucous membrane on the other side. The cartilage can be cut back as far as required. Prior to using the curette, the upper limit of the cartilage removed may be outlined with a knife; then the cartilage is dug out with the curette. That gives entrance to the opposite side. The bone at the base is removed with either the biting forceps or the sharp narrow chisel; the bone is chiselled off flat with the floor of the nose.

The Asch operation is satisfactory in roomy noses, but Dr. MacKenty's experience with it is that it leaves too much thickened septum, and if there is a narrow chamber it remains abnormally thick and interferes with proper breathing.

Dr. MacKenty advised doing the modified submucous operation by the combined use of cocain and ether. It is very difficult to manage young children under cocain. But if the child will submit, he prefers doing the first part of the operation,—the hemorrhagic part, the dissecting of the mucosa, under cocain, and then doing the cartilage and bone work (painful part) under ether. There is no reason why the two should not be used together, for ether is an antidote for cocain poisoning.

The Severer Types of Tonsillar Infection. By D. S. DOUGHERTY, M. D.

(Original contribution to THE LARYNGOSCOPE, *p. 707, June, 1911.)*

The Oro-pharynx as a Portal of Entry for Infection. By L. F. FRISSELL, M. D.

(Published in full in this issue of THE LARYNGOSCOPE.*)*

DISCUSSION.

DR. MAYER said there was little to be added to the admirable papers which had been presented, and it was a great aid to the clinicians to have men paying attention to the origin of disease and studying it from the bacteriological and pathological standpoints and presenting their views. The dispute, however, is still on, and there are still some who doubt the possibility or likelihood of the tonsils or any other part of Waldeyer's ring being a portal of in-

fection. Such work as Dr. Frissell has done, taking the infection from a throat and infecting animals, goes far to prove that the postulate has been established to those who work from the clinical point of view. As the late lamented Boss Tweed would say: "What are you going to do about it?" Have we reached the ultima Thule in our complete tonsil excisions? Can we prevent invasions outside of these infectious diseases? To go one step further: Take some of the cases that have been so operated upon, and find how many of those who have had their tonsils and adenoids effectively removed have these infectious diseases. That might change our ideas as to the effect. There must be something beside the tonsil port of entry. The whole subject is of vast interest. It would be most desirable to ascertain whether the complete excision is really the thing to be desired, or merely the destruction of the crypts. Practical experience would indicate that the port of entry is undoubtedly by way of Waldeyer's ring.

Dr. Douglass said that the two papers,—one clinical and the other more or less theoretical and experimental,—had again opened up the question of the tonsillar cause of systemic troubles. It has always seemed to him that the question of the tonsils being the port of entry for epidemic and infectious diseases had been certainly proved. We must look upon Waldeyer's ring of lymphatic tissue as an infective body, or body which may receive infection—the same as the lymphatic of a finger or a foot—and we at once recognize that we have exactly the same class of cases from the throat as from any other infectious portal. Dr. Dougherty presented in his paper cases divisible into two classes,— perhaps excepting the first case of leptomeningitis, of which the origin would seem to be in doubt.

Personally, he has never doubted but that tuberculosis finds its entry through the tonsils, especially in tubercular cervical adenitis. Rheumatism, however, would seem to be from mixed causes—sometimes being bacterial and septic, sometimes due to chemical causes. In the septic cases he has for a long time felt certain that the infection might arise, and did arise frequently, through the tonsil. He has often seen cases of acute follicular tonsillitis followed by rheumatism.

The case of the tonsils as the port of entry would seem to have been proved by Dr. Dougherty, clinically, and by Dr. Frissell, pathologically. Dr. Mayer has asked: "What are we going to do about it?" What can be done to prevent these infections? Is it

necessary to institute a vigorous asepsis of the mouth—wash it with sterile or distilled water? Must we sterilize the teeth and mouth? Must we gargle with potash and soda salts to ward off these infections? Or can we depend upon nature to do some fighting for us? These questions are more readily asked than answered.

As a surgeon, it seemed to him unwise—assuming that the tonsils are the port of entry,—to amputate or remove the tonsils while in a state of acute inflammation. If we believe that they are infected, then the argument theoretically would be to remove them while they are acutely inflamed; but against that it must be remembered, —even as cited to-night,—that the removal or even incision of throat tissue when inflamed is often followed by serious consequences. Both the essayists had mentioned cases of diffuse sepsis and acute phlegmon following incision. While it would seem wise to remove the nidus of infection, practical experience teaches that they should be left alone until a safe period. We have the analogy in the appendix, where it is considered unwise to remove an acute inflamed appendix, and safe to remove one during the quiescent period of an appendicitis.

The possibility of systemic infection through the tonsils had again recently been impressed upon his mind by the case of a patient with acute follicular tonsillitis who recovered after three days and then developed an acute arthritis and septic nodules which threatened to result in multiple abscesses. The patient, however, recovered.

Finally and certainly it seemed to him that in the face of all the evidence which had been collected against the tonsil that scarcely anyone to-day could deny the rôle of the tonsil as a sepsis carrier and that we must also cry "guilty" to the charge of the tonsils being a sleeping army which frequently allows the enemy to break through the fortress walls.

Dr. Heller said he thought we might go a step further, assuming that the theory as advanced in the two papers was correct, that the tonsil is the portal of infection. It might teach that the tonsils are hypertrophied because they have too much work to do,—that they are sentinels rather than offenders. While they are portals of infection, perhaps they are doing good work, and we have been doing wrong in removing them, even when not acutely affected. He did not wish to be understood as speaking of tonsils which are large and obstructive,—but perhaps we have been doing wrong in removing tonsils which are apparently not healthy, even though

they have been the cause of severe attacks of inflammation. While the tonsils are the avenues of infection, is it safe to assume that if we remove them the infection will not get into the system in some other way? There is the extensive mucous membrane left, and there may be other avenues. It is impossible to remove all of this tissue. The lingual tonsil remains, the follicular tissue at the base of the tongue is still there. It would seem that perhaps a total tonsillectomy might not be proper. In the lower animals there is no tonsil. The crocodile is the first animal in which it appears. That means something. Nature has never put anything in our bodies unless it has some purpose, and in a growing child, where we find similar tissues, like the thymus, the conclusion might be reached that a total tonsillectomy is not the proper thing.

DR. ABRAHAM said that he had been interested in the question of tonsillar infection ever since reading Dr. Mayer's paper, published some years ago. In reading a paper before the Alabama Medical Society, in 1900, he had presented a little instrument designed as a tonsillar curette. He contended then, and even now, that a tonsil infection should be considered as any other localized infection, and treated accordingly.

Dr. Dougherty had spoken of applying nitrate of silver. That is advised in some text-books, and by good authors, but he has seen some very bad result following that treatment. One of these cases occurred in an actor who went to a specialist's office with follicular tonsillitis, and was sprayed with nitrate of silver. This treatment was followed by an edema of the pharynx and larynx. In regard to the opening of a peri-tonsillar abscess, one can speak better about this in private practice than in the clinics. He insists that his assistants, after opening the abscess and allowing the pus to flow from it, make an application of pure tincture of iodine to the sack, followed by a wick of iodoform gauze. The gauze is removed on the following day and a second application of tincture of iodine is made.

Dr. Dougherty had advised the removing of inflamed tonsils. He never allows them to be removed when in an inflamed state. As stated before, he contended in 1900 that a localized infection of the tonsils should be treated as any other surgical localized infection,—by curetting the crypts, being careful not to denude the superficial epithelium and then treating them. He had presented this matter before the section three or four times. He had not made many advocates, but begged that it be given a thorough trial.

The more he uses this method of treatment the more he likes it, and he employs it in all his private practice,—that is, ichthyol. We know what it will do in the other glandular structures. What its method of action was, he could not say, but given a case of beginning follicular tonsillitis, even with high temperature, chill, etc., he would guarantee to discharge the case within twenty-four hours if the patient would follow directions. If any of the members were sufficiently interested, he would be delighted to give details. Only the day before he had been called in consultation in a case of general infection. The patient was a woman, 35 years of age, the mother of two children, and had been operated upon six months ago by a specialist. Some hours after the operation a severe hemorrhage followed. The case was treated for several weeks. Following the operation the glands in the neck became swollen, the glands in the axilla and the mammary glands became involved. The hemorrhage was from the right side and the infection traveled down and crossed over to the left breast. It was a most peculiar form of infection, and the physicians thought it might be a syphilitic infection, but the Wassermann test proved negative. There is still a portion of the tonsil remaining, which the patient does not wish to have removed.

Another type of infection of which he has seen a number of cases, is a chronic caseous tonsillitis followed by acute infection and general redness and hyperemia, with edema of the uvula and soft palate. A number of these cases have subsided promptly after curetting out the contagious material and applying ichthyol.

DR. DOUGHERTY, replying to Dr. Abraham's criticism in regard to the use of nitrate of silver, said that it was not employed in a case of acute follicular tonsillitis, but acute phlegmon of the tonsil, and the nitrate of silver was applied directly, not sprayed. If he wishes to put anything on a certain spot he applies it, and does not spray it. A spray smears all the adjacent parts; an application touches the particular point.

In regard to peritonsillar abscess, one was a private case, and he had spoken of its being incised and drained, and treated with permanganate of potash. He had called Dr. Abraham's attention to a case in which the application of ichthyol had been very beneficial at the time of the extension of the inflammation along the floor of the mouth. The house surgeon had rushed the patient down to Dr. Abraham, who applied the ichthyol, which proved very efficacious.

As to the first case reported, (the lepto-meningitis) of which Dr. Douglass had spoken, he had himself been at first uncertain in regard to it, though he and his consultors thought it came from the tonsillar infection, because the general infection came immediately after the tonsillar trouble and co-incident with the onset of the lepto-meningitis. He was still of the opinion it was primarily tonsillar. It is possible that in some of these cases he had been wrong in making the incisions. After the incisions had been made in one or two of the cases the question came up as to whether it might not have been better to have adopted some other method, but it had been employed time and again successfully, and in one instance he had even removed a diphtheritic tonsil. There are circumstances where such things are justifiable.

In regard to the question of removing the tonsils: If after the age of 6 or 8 years the tonsil becomes a pathogenic organ and it has lost its beneficial functionating character, it should be removed. Whether such is the case or not, we have not yet arrived at a definite conclusion. We hear a great deal about the removal of the diseased tonsil only and that we should not take out healthy tonsils. The question is—when is the tonsil diseased and when is it healthy? We cannot decide that macroscopically by looking in a child's throat, and we will probably continue to remove tonsils which seem to require that procedure.

DR. FRISSELL, replying to Dr. Mayer, said that Williams states that the tonsillar infections which preceded rheumatic attacks were very slight; where there was an obvious tonsillitis one got a much more acute inflammation, but where the disease was not arrested, the local manifestations were comparatively slight, and that might bear on the question of the function of the tonsil.

Tumor Removed From Larynx of Patient Shown at January Meeting. By THURBER, M. D.

Dr. Thurber said that in order to complete the history of the patient presented at the last meeting, he wished to report that the tumor which had been there for two and a half years had been removed by a cold wire snare. It was sessile, and by getting a grip as near the base as possible he simply evulsed it. There was very little bleeding. The operation was done under cocain anesthesia, and he has since written, saying that his voice is clear and distinct. The diagnosis was simple angioma, without any fibrous element.

Regular Meeting, March 23, 1911.

Report of a Case of Erysipelas of the Larynx. By D. Bryson Delavan, M. D.

(Original communication to The Laryngoscope, *p. 155, March, 1911.)*

DISCUSSION.

Dr. Smith said that he had been much interested in the report of the three cases where the erysipelatous rash appeared externally coincident with the internal involvement. He had not seen a case where the evidence was so clear. He has seen several cases of erysipelatous conditions of the larynx, but there was usually some pus-formation adjacent, and he had come to the conclusion expressed by Sir Felix Semon that all laryngeal edema was erysipelatous, as well as angina Ludovici. He had, however, reported three cases where there were three different causes for the phlegmon, but there was a pus focus in each case. In one case seen with Dr. Wright there appeared to be a rheumatic condition underlying the edema. It has been characteristic of all cases that the temperature has been much lower than exists in external erysipelatous conditions. He had recently seen a case where the infection had gone through the tonsil and infected the gland in the neck, and the whole side of the face became swollen; the pus, however, was far removed from the tonsil so that the general surgeon had to operate externally. Examination of the gland showed the invasion, which evidently entered through the tonsil, to be streptococci.

Dr. Delavan said that he wished to call attention to the value of the ichthyol treatment, which was worthy of note. Its application was simple and easy, and its effect beneficial.

Dr. Abraham said that he thought all of the members would be interested in any formula which would render the use of ichthyol less obnoxious to the patients, as its unpleasant taste was a great bugbear. He had seen at least ten cases of edema of the larynx, some of them very severe, and had never lost a patient, and he attributed his success to the early and constant use of ichthyol. The formula which he has found most satisfactory was: Ichthyol 25 per cent; glycerine, 20 per cent; ol. anaise, 2 per cent; ol. cinnamon, 1 per cent; saccharine, .15 per cent; aqua anaise, q. s. add-100 per cent.

The ichthyol should be applied frequently. It will not do any harm; even if some of it is swallowed, it will not hurt the patient. It is given in rheumatism in five grain doses. He usually applies it every hour for the first twenty-four hours, and every other hour

after that until the condition is relieved. It should be kept constantly present. In edema of the larynx he applies it with a syringe and keeps it constantly present. Many patients object to the taste of the ichthyol, but if prepared in this way and the patients are warned that it will be necessary to use a rather unpleasant mixture they will not object to it. He treated one patient with this application who had a marked laryngitis, and he was back at his work in forty-eight hours.

Dr. Abraham extended his thanks to Dr. Delavan for presenting his report, and congratulated him upon the good results obtained.

Replying to Dr. Johnson, who asked if the mixture could be used as a spray, Dr. Abraham said that it should be used that way but in laryngeal affection he generally employs a small syringe. The patients are directed to apply it with a camel's hair brush to the tonsils and pharynx.

Removal of a Laryngeal Polypus Under Guidance of the Pharyngoscope. By OTTO GLOGAU, M. D.

(Published in full in this issue of THE LARYNGOSCOPE).

DISCUSSION.

DR. HAYS said that he had been much pleased when Dr. Glogau informed him that he had removed this polyp with the aid of the pharyngoscope. He had not himself done anything of the kind with the instrument, and went over to see how the doctor used it, and found that it was a very simple matter. Since then he has employed the pharyngoscope in a number of laryngeal conditions in making laryngeal applications and intra-tracheal injections, and has found that they can be made much easier than with the mirror. The reason is very simple. With the mirror we get an angle and have to use the instrument at right angles to vision. We encounter the same difficulty as if a mirror were placed at right angles to a piece of paper with writing or figures on it, and we attempted to copy these figures by looking in the mirror instead of looking at the figures themselves. On the other hand, with the pharyngoscope, you can work directly in the line of vision. This can readily be appreciated by making a trial. If, however, a straight instrument is used, and one gets it in the line of the lens, the magnification of the part near the lens will obstruct the tip. This can be obviated by allowing the pharyngoscope to go in on one side of the mouth and the instrument on the other, when one simply sees the point of the instrument. One can then guide oneself as the point goes down. It will be very easy to get it in exactly the position desired.

He had been much pleased to hear that Dr. Meyer at the German Hospital, had adapted the pharyngoscope very effectively for placing the tubes through the chink of the glottis when using the Meltzer-Auer apparatus in operations on the chest and lungs.

DR. GLOGAU said that the one disadvantage mentioned by Dr. Hays can be avoided by giving the instrument a slight curve, so that the point can be seen, unobstructed by the part of the instrument in front of the lens. He thought that this method of making applications would be found very helpful in many laryngeal conditions, especially in cases of tuberculosis, where the patients are very sensitive. They can stand the introduction of the pharyngoscope better than the laryngeal mirror. By using the pharyngoscope we avoid the inverted picture of the larynx and have much less trouble in finding any desired point. He thought that students should be instructed in the use of the pharyngoscope and so enable them to have a straight picture of the larynx.

Stricture of the Trachea Following Tracheotomy: Dilatation with the Bronchoscope. By SIDNEY YANKAUER, M. D.

The patient, a young woman, 18 years old had suffered from laryngeal diphtheria at four years of age, for which a tracheotomy was performed, and a tube inserted. Later on it was found to be impossible to remove the tube on account of the dyspnea which accompanied any attempt to do so. The patient wore the tube continually until a year ago. During this time she was able to speak by closing the end of the tracheotomy tube with her finger while speaking, and removing it to breathe. When she first came under observation, there was a tracheotomy wound in the lower part of the neck, and considerable cicatricial tissue on the right side of the wound. The tube was of a medium size and on removing it and closing the fistula with the hand, the patient could take a number of breaths, but dyspnea rapidly supervened. Examination with the laryngoscopic mirror showed only a small opening in the trachea some distance below the cords on the right side toward the anterior portion. On examination from below, by spreading the wound and introducing a small mirror, the same stricture could be seen from beneath.

The dilatation of the stricture was begun from below by the use of Dr. Freeman's frontal sinus sounds, which had just the right shape to be introduced into the tracheal wound and passed upward, through the stricture. These sounds were passed every few days, the patient in the meantime being trained for the subsequent manipula-

tion and passage of the bronchoscope. After a while, the largest of the sounds, three-sixteenths of an inch in diameter, was passed. Thereupon the tracheotomy tube was removed and an intubation tube was introduced into the larynx. The patient, however, could not retain it but coughed it out the next day. An attempt was then made to increase the dilatation from beneath by using larger sounds, but after leaving out the tracheotomy tube the tracheotomy wound contracted, so that when the large sound was introduced it closed the wound, and when passed upwards, closed the stricture, and the patient could not breathe. This larger dilator was one-quarter of an inch in diameter, which is only slightly smaller than the smallest bronchoscopic tube. The dilatation was now begun from above by passing the bronchoscope. The tubes were passed at frequent intervals, and gradually increased in size. With each increase in size there was always a small amount of bleeding following the introduction of the larger size, but finally a tube eleven millimeters in diameter was passed, which is larger than the bronchoscopic tube in the adult. During this time the tracheotomy wound was kept closed by a small strip of adhesive plaster. On June 28, a plastic operation was performed on the fistula, as follows:

A circular incision was made around the fistula near the tracheal mucous membrane, and from this a vertical incision was made in the median line above and below the circular incision. The tracheal half of the fistula was then dissected up, the trachea freed from all cicatricial adhesions, and the edges of the tracheal wound stitched together with a mattress suture placed entirely in the submucous tissue. The external half of the fistula was then dissected free from its cicatricial adhesions and sutured with silk, a cat-gut drain being left in the wound.

The wound healed by primary union, and there was no escape of air into any of the parts. This was partly due to the fact that a cat-gut drain was inserted into the wound, and a deep stitch taken. The wound healed on the third or fourth day and is now perfectly smooth.

The case seems of particular interest and importance just now, because of the enthusiasm with which laryngostomy is being urged for this condition. Two eminent laryngologists who saw the patient, advised laryngostomy, but the result of the dilatation shows that it was not necessary. After the plastic operation had been done it was no longer possible to recognize the site of the previous stricture, the lumen of the trachea being as large at that point as elsewhere. The operation was performed last June, and two months

later the trachea showed the same condition, its lumen being completely restored.

DR. DELAVAN congratulated Dr. Yankauer that he had not resorted to the usual procedure for the relief of laryngeal stricture but had succeeded with a method of his own. Last year much was said about laryngostomy; this year, very little is heard about it. Might it not be the same with the artificial bridge for the nose? New methods are tried and discussed and then the time comes when we hear nothing of them, which would seem to indicate that they were not entirely successful. It seems to be the universal rule not to report failures in surgery. Successes are reported, not the failures, and since not much discussion has been heard recently concerning the artificial bridge for the nose, it may be assumed that the method has not proved successful. He would be interested in hearing the result of Dr. Yankauer's case.

Case of Nasal and Cutaneous Syphilis Treated with "606". By FRANCIS W. WHITE, M. D.

The patient states that seven and a half years ago he contracted lues and was treated for five or six months. The eruption covered the greater part of the body and there was falling out of the hair of the head. From that time on he got along pretty well until two and a half years ago, when an eruption appeared on the left side of the face, which passed over the nose to the right side. He was treated intermittently at various places with the usual mercurial treatments, including hypodermatic injection. On December 13, he came to the Manhattan Eye, Ear and Throat Hospital to be treated for trouble in the nose. There was an infiltration of the septum and alae and there was soreness and tenderness, especially on the left side. He was kept under treatment for four weeks, but did not get along very well. The treatment was then stopped for two weeks and the condition got worse. At the end of January he decided to come into the hospital for treatment with "606." He was given an intravenous injection. There was no reaction and he felt well, and he was discharged on February 2, but came to the clinic every clinic day. On February 9, the condition was greatly improved, although both sides of the face were matted with scabs and pussy discharge, so that he had to mop his face frequently. That cleared up, with only a few scabs remaining. On February 15, practically two weeks after the injection, the condition was about the same as now presented, the main difference being that the scars were deeper. On March 21 he gave a very positive Wassermann reaction.

DR. SMITH said that the patient had been treated in his clinic, and when he first saw the case the condition of the septum and the side of the nose looked as though about to break down. The main interest of the case lies in the fact that previous to the administration of the "606" every known method of treatment was tried. The patient had been under the care of some very capable syphilologists without any apparent effect and the sudden improvement under the "606" was very remarkable.

DR. MCCULLAGH said that he had administered "606" in three cases of syphilis with nasal, pharyngeal and laryngeal lesions, and the improvement has been very marked and very rapid, but in all three cases, even after a greater length of time than in the case reported by Dr. White, the Wassermann has remained positive One patient had had a second injection of the salvarsan, but no Wassermann test has been made since. The last case was treated about six weeks ago, and the Wassermann reaction is still very strongly positive. As the patient was a young girl, he did not feel that it would be safe to give a second injection yet, for he understood that arsenic is sometimes found in the urine sixty days after the injection,—that is, by the intra-muscular method. He has employed the intra-venous method in all his cases. Whether or not there was any fault in the technic of the injection, the patients have all had fairly sore arms afterward, and usually the skin incision breaks down. For the first night following the injection they are pretty uncomfortable; after that there is very little discomfort. In all instances he has cut down, isolated and incised the vein, and then used a dull needle, so he could not think that the reaction around the incision was due to any unintended injection of the tissues, but was not sure that it was not due to the salvarsan coming into contact with the sub-cutaneous tissues.

DR. CARTER said that Dr. White was to be congratulated on the results that had been obtained. An especially interesting point was that the injection of "606" had not been followed by any reaction. There was no rise of temperature nor any of the symptoms which sometimes follow the injection. The treatment seems to be especially adapted to these very resistent cases of skin syphilide. It is also very useful in congenital cases of syphilis where there has been great destruction of the bony structure of the nose. These cases are always followed by great nasal deformity. The quicker such cases are cured, the less the deformity, and the more easily relieved by Dr. Carter's bone transplantation operation.

Dr. MacKenty said that he had used the salvarsan four times, injecting it intra-venously. In two of the cases there was a good deal of reaction. In the others, he opened the veins and washed them out with salt solution after the injection, and there was no local reaction. The idea was to wash away the salvarsan, which was the cause of the reaction. That can be obviated by running in a certain amount of normal salt solution. The wounds generally break down as Dr. McCullagh had described.

Dr. White replied to a query from Dr. Wilson as to whether another injection would be given or mercurial treatment instituted by saying that the last Wassermann was very positive, and that he would wait a little longer, until they get one or two more positive Wassermann tests, a recurrence, beginning recurrence, or a negative Wassermann. In many cases the "606" treatment is preceded by mercurial treatment as was this. Others are followed by mercurial treatment or a second dose of "606" given.

Dr. White inquired of Dr. McCullagh whether there had been any recurrence of the original condition in the cases where he had a positive Wassermann reaction.

Dr. McCullagh replied that in both cases the improvement was marvelous for the first week; then the condition seemed to reach a stage where the healing was as slow as before the injection and there was no apparent continuous improvement. After the injection the patient had no further anti-syphilitic medication. The effect of the salvarsan alone was watched.

Dr. White said that Dr. McCullagh's experience was very interesting, and while the Wassermann remains positive for as long as sixty days or more, he did not know that there was any special indication to give another dose immediately or for several weeks after, unless there was a recurrence, or unless it came to a point where the improvement ceased but the original condition had not entirely disappeared.

Washing out of the veins seemed to be a very good procedure, although the cases so far have had no reaction. The patient had no pain. He had no morphine during the first night nor subsequently. He had complained that the cord—as he called it—was tender, but beyond that he had no trouble. He is very grateful for the results of the treatment and will permit himself being watched for a long time to come.

Dr. Hurd asked if the vein had been washed out.

Dr. White replied that he had not done so in his cases but that he would try that method in a subsequent case.

(To be continued).

BOOK REVIEWS.

The Deaf Child: A Manual for Teachers and School Doctors.
By JAMES KERR LOVE, M. D. Pp. 192, illustrated. Price, 4s 6d net. Bristol: John Wright & Sons, Limited. 1911.

The wave of activity which has been sweeping over the otologic world within the past few years will receive a new and substantial impetus through a careful perusal of Dr. Love's timely little book "The deaf child." It is rather an unusual fact that in this really important department in the scope of the otologist so few medical men have given the question much practical application or serious thought.

Dr. Love has been a devoted worker and rugged pioneer in the promulgation of the teaching, care and development of the deaf child, not only in England, but also in America. We recall with much pleasure his recent visit to our country and his active participation in the symposium on "The deaf child," at the annual meeting of the American Laryngological, Rhinological and Otological Society in Washington, where this subject received a most marked and substantial stimulation and endorsement at the hands of the fellows of this influential organization.

The time is propitious for every medical man and especially for every otologist to inform himself as thoroughly as possible concerning the work that has been done in this field and the possibilities that are offered for the development and education of the deaf child.

This little manual sets forth the general principles involved in the examination of the physiological condition, the care and educational possibilities of the deaf child in its manifold phases, and presents a vast amount of valuable data with which the otologist should be familiar in order that he be thoroughly qualified to participate in this department of his specialty.

Every chapter reflects the individuality of the life-long experience of the author who easily ranks as one of the first authorities in this field of science.

The little volume is gracefully written in simple language and free from all unnecessary scientific dissertations. We seriously advise every otologist to own a copy of this valuable monograph.—M. A. G.

Functional-Test of the Vestibular Apparation. (Funktionelle Pruefung des Vestibular-Apparates.)
By DOCENT R. BARANY AND DR. K. WITTMAACK. Pp. 148, with 2 illustrations in the text. Gustav Fischer, Jena, 1911.

This monograph is the official report of Barany presented at the twentieth session of the German Otological Society in Frankfort, June 2, 1911, and contains in up-to-date form the anatomical and physiological considerations of the vestibular apparatus, functional tests, the pathological status of diseases of the labyrinth, spontaneous nystagmus in in-

tra-cranial complications, the reaction of the vestibular apparatus, peripheral and central intra-cranial diseases and other data, as advocated by the author in his original monograph on this important subject.

Atlas of Radiography of the Mastoid Region and the Accessory Sinuses. By JOSEPH C. BECK, M. D., Clinical Professor of Oto-Laryngology, College of Physicians and Surgeons, University of Illinois. Attending Oto-Laryngologist to the Cook County Hospital. Oto-Laryngologist to the North Chicago Hospital. Professor of Oto-Laryngology, Chicago Eye, Ear, Nose and Throat College. St. Louis. THE LARYNGOSCOPE COMPANY. 1911.

Beck's "Atlas of radiography of the mastoid region and of the accessory sinuses" consists of photographs bound loosely in album-form and in convenient size. The photographs are preceded by a paragraph giving historical matter, and a few paragraphs stating clearly and concisely radiographic and photographic technic. The majority of the photographs are faced by an explanatory tracing bearing markers and legends.

The main part of the book begins with four stereoscopic photographs illustrating the position of the patient and the X-ray tube, and similar photographs of the accessory sinuses and the mastoid region. Following these there are some twenty-five full-sized photographs from X-ray plates of the accessory sinuses and the mastoid. They cover both normal and abnormal anatomy. The plates of abnormal conditions are chosen from typical cases.

The leaves of the atlas were purposely left unnumbered in order that the reader may insert other photographs at his pleasure. It is to be doubted if the reader will ever do this. Therefore, numbering of the pages in the usual way would make the volume more serviceable. Once or twice the writer departs from the strict interpretation of the plate in hand and drops into a discussion of surgical procedures. In one place he could not resist the temptation to say a good word for the use of bismuth paste. The photographs illustrating the X-ray findings in acute mastoiditis have no explanatory tracings. Here they would be especially serviceable. The reviewer must admit that the writer's interpretation of the first of these mastoid plates reads into it more than the reviewer can see. This is not written in a carping spirit because X-ray plates, and, especially photographs made from them, should be looked at sympathetically. Also, they should be looked at expectantly, much as a sailor looks into a fog.

The paper of the book is excellent and the book is finely printed. The author and the publisher are to be congratulated on overcoming so successfully the trying mechanical details of reproducing and binding the photographs. The atlas is short, compact and complete. It should prove to be a very useful book.—MOSHER.

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